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COLONY OF MAURITIUS.

ANNUAL REPORT

ON THE

MEDICAL AND HEALTH DEPARTMENT

FOR

1904.

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ANNUAL REPORT

ON THE

MEDICAL AND HEALTH DEPARTMENT

FOR

1904.

The Honorable the Acting Colonial Secretary,

1. I have the honor to transmit, for the information of His Excellency the Governor, the medical report on the health and sanitary condition of Mauritius for the year 1904, together with the returns, &c., appended thereto.

2. I regret that, owing to the outbreak of small-pox at the beginning of the year, the extra work which had to be attended to, delayed the compilation of the returns and interfered with the preparation of the report.

H. LORANS,
Director.

29th. June, 1905.

I.—STATISTICS OF POPULATION.

According to the figures kindly supplied by the Registrar General,* the estimated population of the Colony on 31.12.04 amounted to 378,745 which shows an increase of 4,101 over the figure of the previous year.

2. The number of Immigrants having been 6,191 and that of Emigrants 4,129, the increase of population due to immigration has only been 2,062 and the further estimated increase in the population (2,039) is therefore due to natural factors which point to a more satisfactory state of things.

3. In fact, the year 1904, unlike the two preceding ones, has witnessed a marked increase of births over deaths. 14,103 births were registered against 12,064 deaths while the figures for the previous year were 13,611 and 15,034 respectively.

4. The birth-rate which stood at 36.2 per mille in 1903 has further increased for the year under review and reached 37.6.

5. It is satisfactory also to record a notable decrease in the death-rate which was 32.2 per thousand during 1904 against 34.0 and 39.9 during 1902 and 1903 respectively.

6. The birth-rate ranged from 33 per mille in the district of Savanne to 44.7 in that of Rivière du Rempart. The death-rate from 24.5 at Moka to 47.7 o/oo at Port Louis.

7. A fall is also noticeable in the mortality of children under five years of age. The total deaths for that age period was 3,723 or 30.9 % of the total deaths at all ages against 4,968 or 33 % in 1903.

8. Deaths among infants under one year were 2,077 or 147 per thousand of the births for the year, but the value of these figures is somewhat lessened by the fact that the registered still-births amounted to 8.5 % of the total births.

9. The morbid causes principally responsible for the mortality figures recorded at the Registrar General's Office were, in order of importance, malarial fever, 34 % of deaths from all causes, tuberculosis 7.4 % of deaths from all causes, pneumonia, bronchitis, dysentery, plague, influenza, cardiac diseases, diarrhœa, cachexia and renal diseases. Statistics based upon such figures are however liable to a considerable percentage of error owing to the present deficient system of re-

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* Vide statement annexed.

gistration in regard to the causes of death. There can be no question, for example, that deaths from various acute or inflammatory conditions in which fever is a more or less prominent feature, unduly swell the number returned under malarial fever, while not a few cases in which death was in reality due to pulmonary tuberculosis are entered under the headings of pneumonia, bronchitis or influenza. Some improvement has no doubt followed upon the enforcement of Chapter III of the Sanitation Ordinance of 1900 for the medical certification of deaths in townships and a few populous localities, but the area thus brought under control is proportionately too small to render the death returns for the whole Island sufficiently accurate for sanitary purposes. It is for that reason that, when discussing the prevalence of sickness in Chapter II of this report, the hospital and dispensary returns have been selected in preference as affording a firmer though less comprehensive basis for calculation.

II.—PREVALENCE OF SICKNESS.

Judging from the Hospital and Dispensary Returns, the smaller death-rate, and the lower case mortality which have obtained during 1904, the sanitary condition of the Colony last year has been far more satisfactory than that of the two preceding ones.

2. During the year under review 17,492 patients sought relief in the different Hospitals of this Colony against 20,867 and 17,874 during 1903 and 1902 respectively.

3. The case mortality, 5.42 %, also shows a decrease when compared with 5.98 and 5.57, the rates for the two preceding years.

4. The same satisfactory lowering in the number of admissions and case mortality has been observed on sugar estates.

5. *Malarial Fever* :—As usual, this complaint is answerable for the greatest number of admissions to Hospitals. The figure for 1904 stands at 3,039 and is inferior to those recorded for 1903 and 1902 which are 4,788 and 3,360 respectively. The influence of meteorological conditions on the prevalence of this disease will be considered under Chapter IV.

6. It may however not be out of place to record here that in 1904 a scheme was started to combat malaria by the prophylactic use of quinine. Schoolmasters in fever-stricken districts were entrusted with ready made packets of quinine and supplied with written directions respecting the use of the drug and its issue to the sick and poor. Only those who were in a position to pay were charged cost price for the specific. Full advantage has not as yet been taken by those in whose favour this new departure was made. The scheme being a tentative one and the number of distributing stations limited, it is too early to come to a conclusion in respect of the results obtained; but some good has evidently been done by this measure in several notoriously malarial localities.

7. *Hypertrophy of the spleen* :—This complaint has been responsible for 373 admissions against 492 in 1903. Under this heading a large number of cases of chronic malaria are entered, and the decrease was to be expected on account of the lower incidence of malaria already referred to.

8. The work of Leishman, Donovan and other observers was specially brought to the notice of the Government Medical Officers with a view to ascertain whether some of the cases falling usually under this definition are not in reality due to the other causes to which attention has recently been called, but the investigations have all been negative so far, and no appearance of the Leishman-Donovan bodies has been detected.

9. *Dysentery*:—505 cases applied for treatment in the Hospitals during the year under review, against 834 in 1903. Although the morbidity has decreased by 329, yet the rate of mortality has increased from 12.7 % to 17.2. This can be accounted for by the fact that only the severer cases sought for Hospital assistance on account of the greater facilities during the past year, for treatment at home, of many of the patients suffering from a milder form of the complaint.

10. *Enteric Fever*:—Fifteen patients were admitted for this complaint, the number being the same as that for last year. Of these, five died, giving a case mortality of 33.3 % which is higher than that of 1903.

11. In this connection it should be recorded that of the 5 deaths, one occurred almost immediately after, and another within 48 hours of admission.

12. A third fatal case is the one reported from Beau Bassin Prisons Hospital. Investigations were made to try and find out whence the deceased, a European who had been in jail for some weeks previous to his illness, contracted the infection, but they threw no light on the occurrence. This prisoner consumed no other water than that of the Mare-aux-Vacoas and no vegetables than cooked ones. Besides, all milk issued to prisoners on milk diet is boiled.

13. The Medical Officer was apparently justified by the clinical symptoms to return that case as one of typhoid; but seeing that it remained unique, that Widal's test resorted to on several occasions invariably proved negative, the accuracy of the diagnosis must necessarily remain doubtful, the more so as no post mortem was unfortunately held.

14. Besides the 15 cases treated in Hospitals, 128 were notified in accordance with the Contagious Disease Ordinance, an increase of 62 over 1903. The number of deaths among these was 26 and the death-rate 20.31 % against 27.27 during the previous year.

15. Though the occurrence of typhoid has been apparently more widely recognized and reported, it must not be concluded that these were all the cases in the Island as many escape attention through the ignorance of the lower classes who very often do not trouble to obtain medical advice so that the disease is neither diagnosed nor notified.

16. The correctness of the view and the part played by the medical diagnosis is examplified by the following table which records the number of cases in each District:—

DISTRICTS.		CASES.
Port Louis		9
Pamplemousses		2
Rivière du Rempart		5
Moka		4
Flacq		9
Grand Port		17
Savanne		16
Plaines Wilhems :—		
Beau Bassin & Rose Hill	6	
Quatre Bornes	10	
Phœnix & Vacoas	10	
Curepipe	55	
		81
Total		143

But although 55 cases are charged against Curepipe, it should be stated that the real number is smaller as some cases reported from the Station Hospital occurred among the military who were not residents of that township.

17. It would at first sight appear strange that the only district which can boast of a pure water supply is the one in which the disease appears to be the more prevalent. But apart from the local and social conditions which, as just stated, have led to medical opinion being obtained in cases of continued fever in that district, it must be remembered that unfortunately, for various causes which have formed the subject of several reports, a large part of the population, even in the township of Curepipe, does not make use of the Mare-aux-Vacoas supply, while those who use it frequently do not store it so as to protect it against the numerous existing causes of pollution.

18. Complaints were again made as to the quality of the Mare-aux-Vacoas water during 1904, owing to its smell and colour. These defects have been discussed elsewhere, and, as was then stated, no pathogenic effects resulted from the use of that water even when it was at its worst in the drier months of the year. However the occurrence led many to give up its use in favor of wells and so called springs which are unfortunately too common at Curepipe, with disastrous consequences in several cases. The necessity of remedying any defect in the Mare-aux-Vacoas water supply and distribution is accordingly of great moment.

19. *Diphtheria.*—There was no admission for this complaint in any of the Government Hospitals. However, 17 cases with 2 deaths were notified, and of these, 5 occurred concurrently in children of the same family. The number of families affected was 12.

20. As usual, the higher regions of the Island were more affected as will be gathered from the following table :—

Districts.		Cases treated.
Port Louis...		2
Savanne		1
Moka		1
Plaines Wilhems :—		
Rose Hill & Beau Bassin...	2	
Quatre Bornes ...	1	
Phœnix & Vacoas ...	3	
Curepipe	7	13
Total		17

21. *Influenza.*—Next to malaria, the disease which accounts for the greatest number of admissions is Influenza. There has been in 1904 a slight decrease in the number of cases treated which stands at 1,036 against 1,055 for 1903. The case mortality has also decreased from 2.9 % in 1903 to 2.31 in 1904.

22. *Tuberculosis.*—The number of admissions for that complaint, 1,013, shows a decrease of 97 over that of the previous year. However it must not be inferred that the disease is really on the decrease as the smaller number of persons seeking relief for this malady may perhaps be accounted for by the greater evenness of last year's climatic conditions.

23. In the report for 1903, attention was called to the necessity of having special accommodation for patients suffering from the disease.

24. The special Committee appointed to enquire into the subject, has, during the year, forwarded its report which on the whole supports the suggestions above referred to. It is to be hoped that the finances of the Colony will, at no distant date, permit of the well-known desiderata in this connection being given effect to.

25. *Pneumonia* has been less prevalent in 1904 than in 1903, the number of cases admitted being 334 and 443 respectively. The improvement which was noticed last year with regard to the lower death-rate, has been still more marked this year when the case mortality was only 21.3 against 28.3 in 1903, 31.6 in 1902 and 33.3 % in 1901.

26. *Nephritis.*—252 cases were admitted for this disease, showing a decrease of 86 on the figure for 1903. The death-rate has been nearly the same, 16.9 % in 1903 and 17.1 in 1904.

27. *Beriberi.*—Only 16 patients were treated against 100 during 1903. The disease occurred among the Chinese only and the cases appear to be the last of the epidemic referred to in my previous yearly report.

28. *Measles.*—A single case occurred in the Colony, the patient, one of a batch of Immigrants from India, was sent to and isolated at the Civil Hospital on the raising of the quarantine at Cannonniers' Point. He recovered and the infection did not spread.

29. *Syphilis.*—The number of cases admitted stands at 352 i.e. a decrease of 16 in the figure for last year. However there is an increase of 21 in persons primarily affected, the figure for the year under review being 131.

30. An increase in the number of primary infections could unfortunately also be recorded in respect of people who do not resort to Hospitals on account of this complaint. Under the circumstances, though it is a delicate subject to deal with, and though reference to the matter is rarely met with, unless in medical literature or special works, I think I should lay aside such a reserve in this report. Moreover it is a question in my opinion, whether it would not be more profitable to the cause of morality and rendering better service to suffering humanity to draw more openly attention to the dangers of a complaint which is propagated as much by ignorance as by other causes, and which not only plays havoc with the health of the individuals primarily infected, but not infrequently impairs more or less seriously that of their offsprings as well. I made some comments on the subject in my last annual report, and now again bring the matter to notice in the hope that these remarks will receive due consideration at the hands of those who, as heads of families and institutions, or from their professional standing, could, by a timely and appropriate hint, save many adolescents and ignorant people from ruining their health and often their happiness.

31. *Leprosy.*—Only 6 cases were temporarily treated in the Public Hospitals this year against 15 in 1903. The return kindly supplied by the Poor Law Commissioner shows that there were 41 admissions (34 males and 7 females) at the Hospice St. Lazare, while 80 males and 25 females were under treatment in the Institutions on the 31st December 1903. Twenty-one patients died in that Intitution during the year 1904.

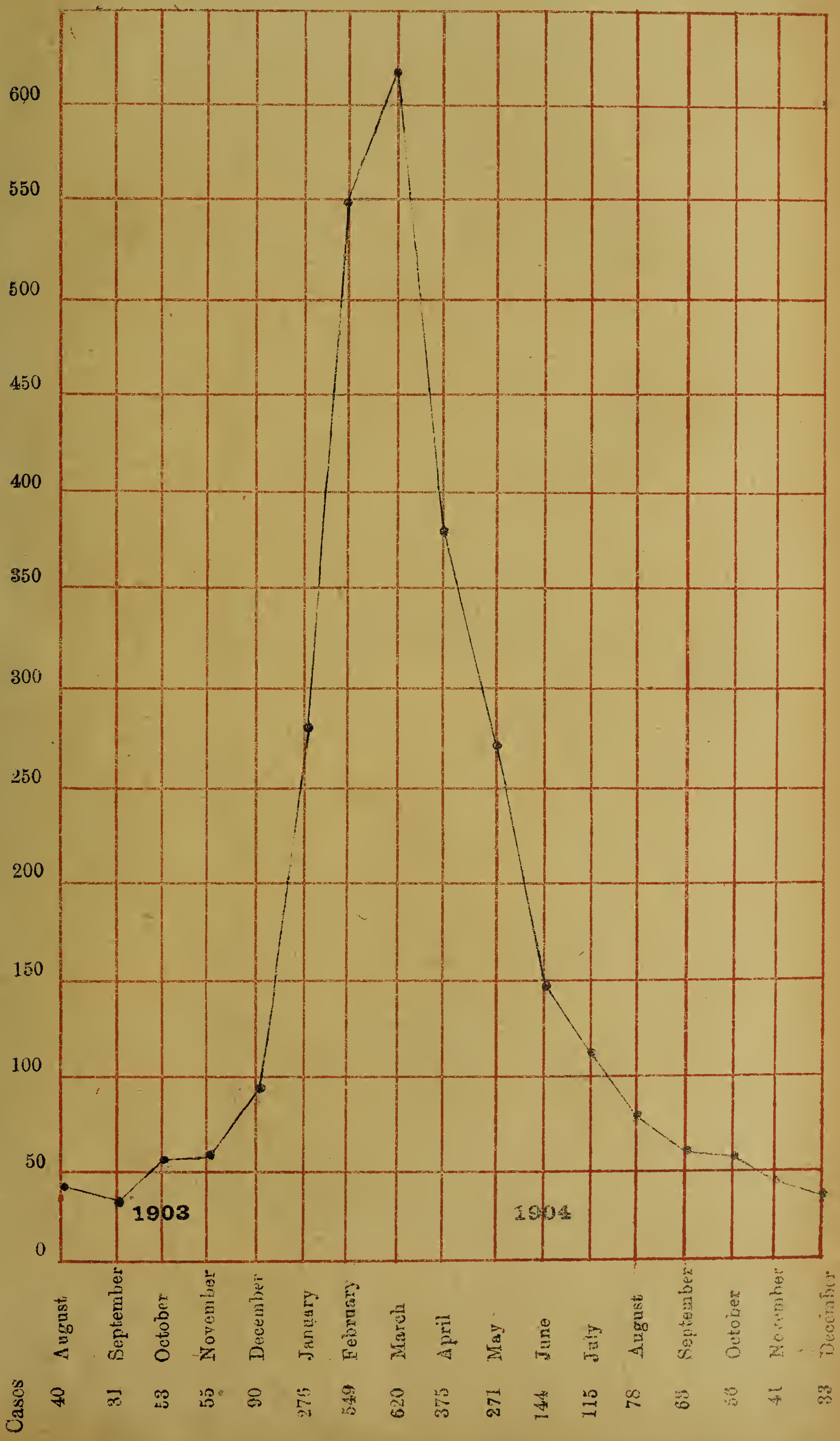
32. The decrease in the number of sick is more apparent than real. It is due to accidental circumstances as the se-

CHART I.

Chap. I, par. 36.

PHAGEDAENIC ULCERS

Chart showing the monthly number of cases of PHAGEDAENIC ULCERS treated in the several Hospitals and Dispensaries of the Colony from August 1903 to December 1904.



of studying the disease in all its stages, and, I am glad to say, these Officers have taken the fullest advantage possible of the material at their disposal. They have confirmed the view already expressed that the causative agent is the bacillus of Crendiropoulo, and have made a complete study of the micro-organism in its morphological aspects and other characteristics so that no further reference need be made by me to the subject, beyond drawing attention to their work which is recorded in the annexures to this report.

38. *Plague.*—54 admissions against 95 in 1903 were recorded during the year under review in the various public Hospitals. This figure does not however fully indicate the lesser prevalence of the epidemic, but this matter will be referred to in Chapter V of this report, and it will be sufficient to say here that, as usual, the sick found suffering from plague were isolated without delay and removed to lazarets when possible. All these cases occurred among recently admitted patients, and in no instance was infection contracted in any of the Hospitals.

39. *Mental diseases.*—49 patients suffering from insanity were temporarily admitted in the General Hospitals in 1904 against 36 in the previous year; but, as will be observed from the report of the Medical Superintendent of the Lunatic Asylum, the new admissions in that Institution during 1904 amounted to 116 against 104 in the year previous.

40. The details concerning the Lunatic Asylum will be found in the annexed report of Dr. Paddle.

41. Besides the 413 patients under the immediate care of that Medical Officer on 31.12.04, there were 102 in the Lunatic Branch wards of the Barkly Asylum in which are treated the surplus number of quiet and apparently incurable dements under confinement. If we add to that number 63 certified lunatics under probation to the care of their families, it will be seen that the proportion of certified insane in the population was 1.52 per thousand on 31.12.04.

42. *Yaws.*—This term appears for the first time in the nosological returns of the Hospitals of this Colony. Dr. Rouget has come to the conclusion that the well-known painful thickening in the sole of the feet commonly called by the natives "Crabe-Roches" is a variety of yaws. Further investigation of the matter is however desirable before a definite opinion can be expressed as to the real nature of these cases.

43. Information concerning the other diseases which have been treated in the General Hospitals will be found in Statement III.

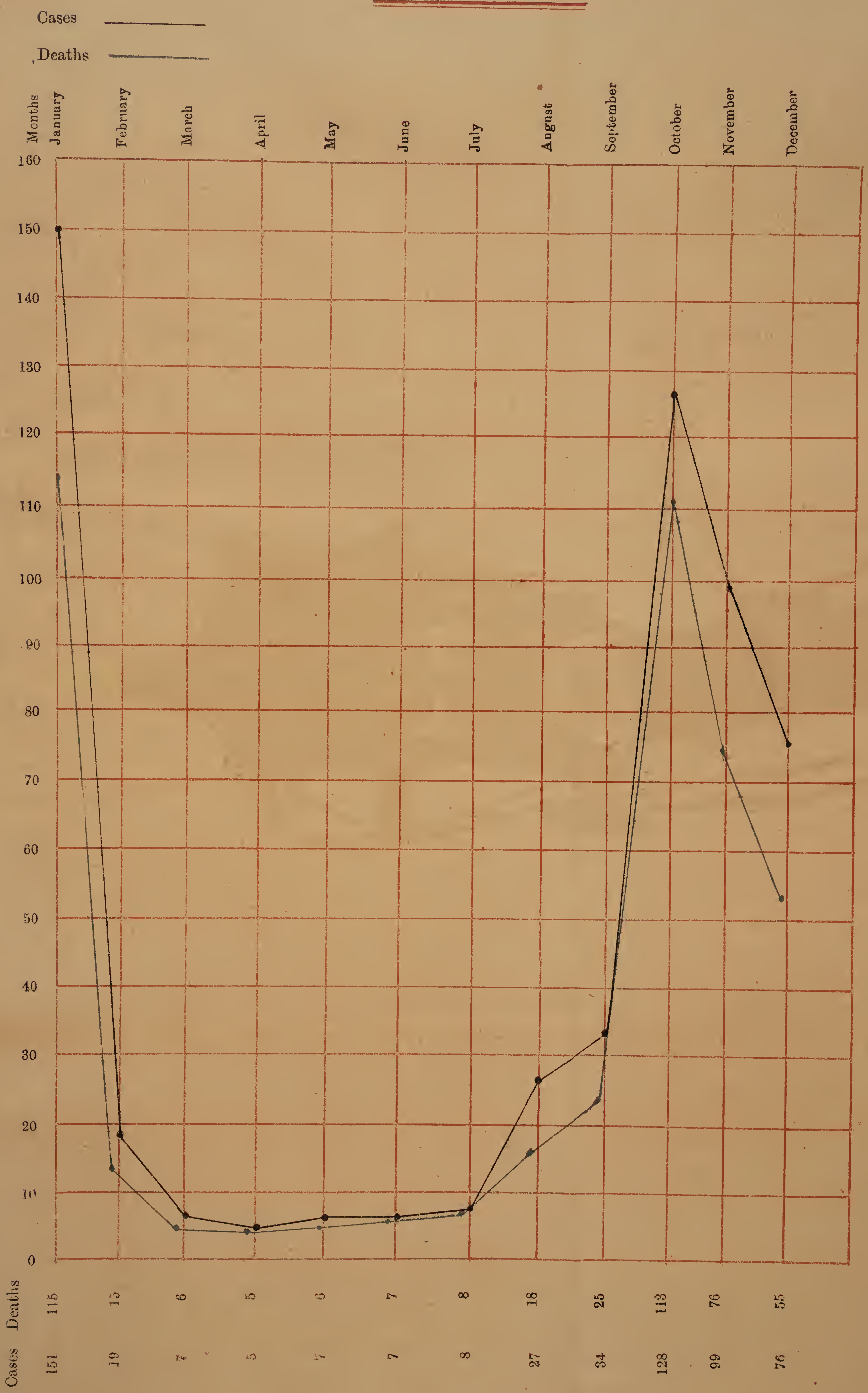
III.—METEOROLOGICAL CONDITIONS OF THE SEASONS AND THEIR PROBABLE EFFECTS WITH REGARD TO SICKNESS.

Statement II when compared with the similar one for 1903, reveals interesting points to the local sanitarian. In the first place, the two first months of the year have been much drier, for although the total rainfall of the year stands at 43.115 ins., against 41.705 for 1903, it will be observed that in March alone, the amount of rain that fell reached 13.210 ins. so that on the whole, March excepted, the average rainfall has been much lower than that of the previous year. Again, there has been none of that continuous rain which in 1903 constantly fed the pools which had once formed while there were periods of absolute drought which in the earlier part of the year, favoured their rapid drying up.

CHART VI.

Chapter IV, par. 8.

Chart showing the monthly number of PLAGUE cases which occurred in the Colony as well as the number of Deaths during the year 1904.



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2. During the earlier part of the year, the winds, it will be noticed, blew on the average, at a greater velocity than during the corresponding period of 1903 so that their drying influence over the pools was also felt.

3. In addition, the degree of humidity for 1904 was much less than that for 1903 so that, as a consequence, evaporation was more pronounced.

4. Resuming then, we have lower rainfall, diminished humidity, and increased winds combining in their influence to do away rapidly with whatever pools may have formed and, consequently, unfavourable conditions for the breeding of mosquitoes and accordingly on Malaria. That disease, as recorded in page 6 gave rise to a smaller number of admissions, but it cannot be denied that its prevalence has been great and a source of much misery and suffering.

5. In a Colony like Mauritius where vegetation is intense, affording, as it does, all the conditions necessary for the propagation of anopheles, with a population of 378,000 inhabitants scattered all over the Island, most of whom are natives who live in ill ventilated straw huts, who are averse to the ideas of sanitation, the fight against malaria is most arduous. Neither can there be much hope of success so long as the present conditions hold. Financial considerations have not lately permitted the undertaking of the more lasting works of drainage and canalization, while, on the other hand, poverty and ignorance have been constant obstacles to the progress in sanitation amongst the heterogeneous uneducated population of the Island.

6. As a natural consequence of the meteorological conditions, those diseases, among the ætiology of which dampness and variations of temperature are to be reckoned, have been less prevalent. Hence we find that Influenza, Pneumonia, Diphtheria and their sequelæ as Nephritis, &c., also account for a much lower number of admissions.

7. In last year's report, I have referred to the absence of correlation between temperature and rainfall on the one hand and the spread of plague on the other. There has been no indication during 1904 that the conditions which have this year prevailed, have had any influence on the lesser severity of the outbreak.

8. Dysentery which generally follows the fluctuations noticeable in the incidence of malaria has, as may be seen by referring to Chapter II, given rise to five-eighths of the number of admissions for the year previous on account probably of the fewer disturbances in the water supplies of the Island resulting from a lesser amount of manured soil finding access to the water courses.

IV.—RECURRENCE OF PARTICULAR DISEASES.

Malaria.—The following table gives in a comparative form the admissions in hospitals on account of the disease during the last six years :—

Years.	1899	1900	1901	1902	1903	1904
No. of cases ...	4,152	2,848	4,182	3,360	4,788	3,039

Chart II. 2. The annexed chart shows at a glance the number of cases admitted each month in the hospitals and the rainfall in inches. The tracing confirms the observations made long ago that the disease is most prevalent in the first four or five months of the year and shows that in 1904 the maximum was in March. The reasons for this occurrence have already been stated above.

Chart III. 3. *Dysentery.*—The appended chart gives the curve of the disease for 1904. The incidence, it will be noticed, is almost similar to that of malaria and, if allowance is made for chronic cases which swell the number in certain months, it is apparent that both follow practically the rainfall of the beginning of the year.

Chart IV. 4. *Tuberculosis.*—The accompanying chart gives the number of admissions and deaths from tuberculosis throughout the months of the year. The curve of mortality which is roughly parallel to that of admissions, confirms the opinion that the patients sought relief in the hospitals only when they had reached the latter stages of the disease.

Chart V. 5. *Bronchitis.*—The curve of prevalence of the disease shows a somewhat erratic course and, the incidence of the cases reaching a maximum in March, has apparently been more influenced by exposure to rain than by the variations of temperature which, as already stated, was mild and even during the year under review.

6. *Plague.*—The severe epidemic recorded in 1903 continued into the first months of 1904, but quickly subsided at the end of the first quarter of the year.

7. The following table gives the number of cases detected, the deaths and death-rate recorded in the Colony, each year since 1899 :

Years.	No. of cases.	Deaths.	Death-rate o/o.
1899	1,416	1,117	78.9
1900	796	593	74.5
1901	1,093	805	73.6
1902	506	386	76.3
1903	1,395	1,035	74.2
1904	568	449	79.0

Chart VI. 8. It will be seen that the incidence of the disease in 1904 has been, with the exception of 1902, the least severe recorded so far as the number of cases registered is concerned, but, on the other hand, the death-rate has been, with one exception, the highest. It may therefore be inferred that the virulence of the microbe has in no way abated though a step has been made in the direction if not of success, at least in that of opposing a check to its spread. Indeed, contrary to what has obtained in previous years, the highest number of cases, 151, has occurred, not in October or in November, but in January as will be seen from the annexed chart. (Chart VII.) This maximum forms part of the 1903 epidemic which, as previously stated, practically ended in March 1904. During the next five months, comparatively few cases were detected but a sharp rise began towards the end of August, to reach, as usual in any outbreak, its climax in the last quarter of the year. In October, 128 cases were recorded while in December a marked decrease was noticed, and the epidemic quickly subsided, the last case of the outbreak being recorded on the 16th. March 1905.

CHART III.

Chapter IV, par. 3, page 24.

Chart showing the monthly number of cases of DYSENTERY treated in the different Hospitals of the Colony during 1904

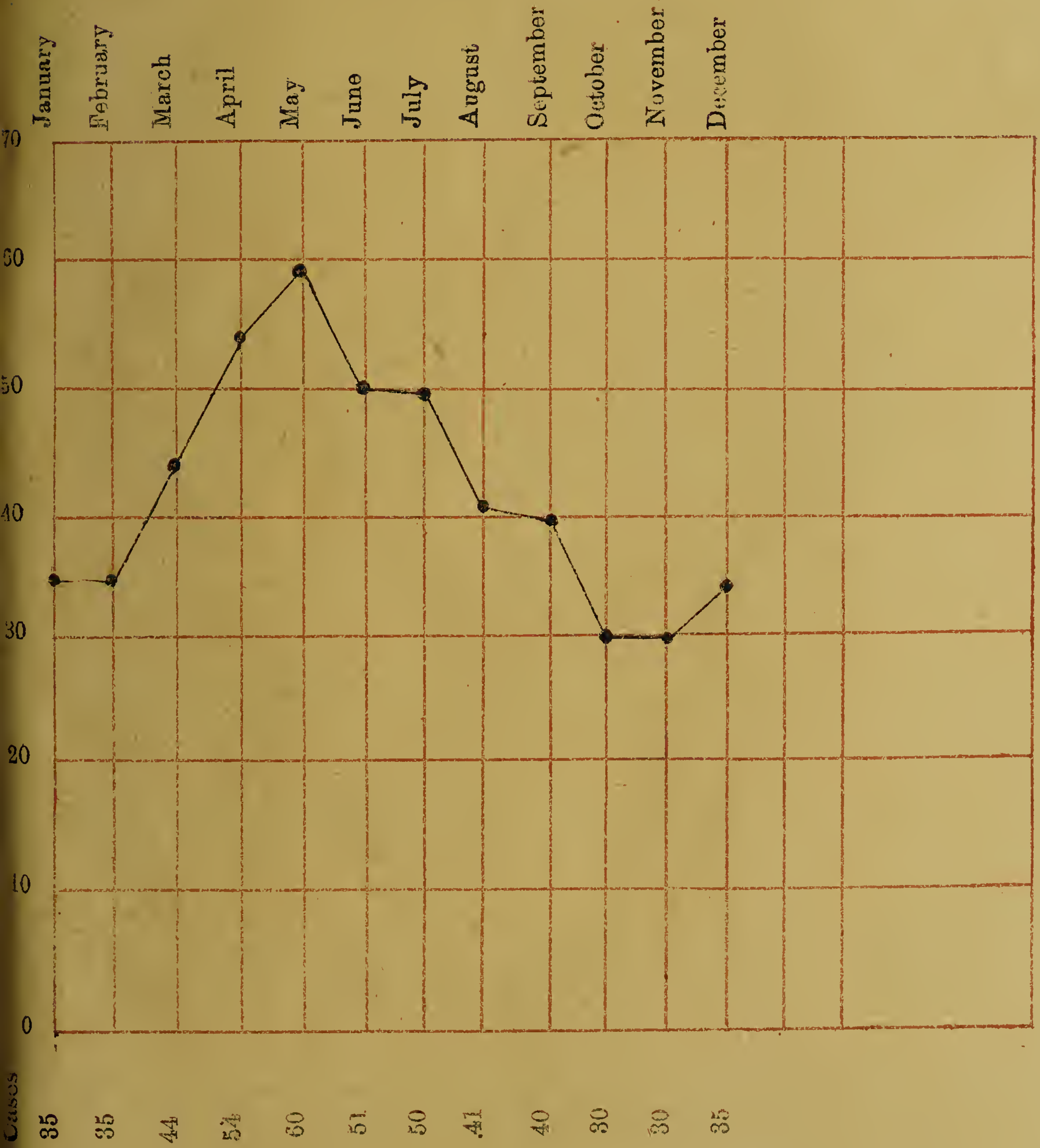

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CHART IV.

Chapter IV par. 4.

Chart showing the monthly number of admissions for, and deaths from TUBERCULOSIS during 1904.

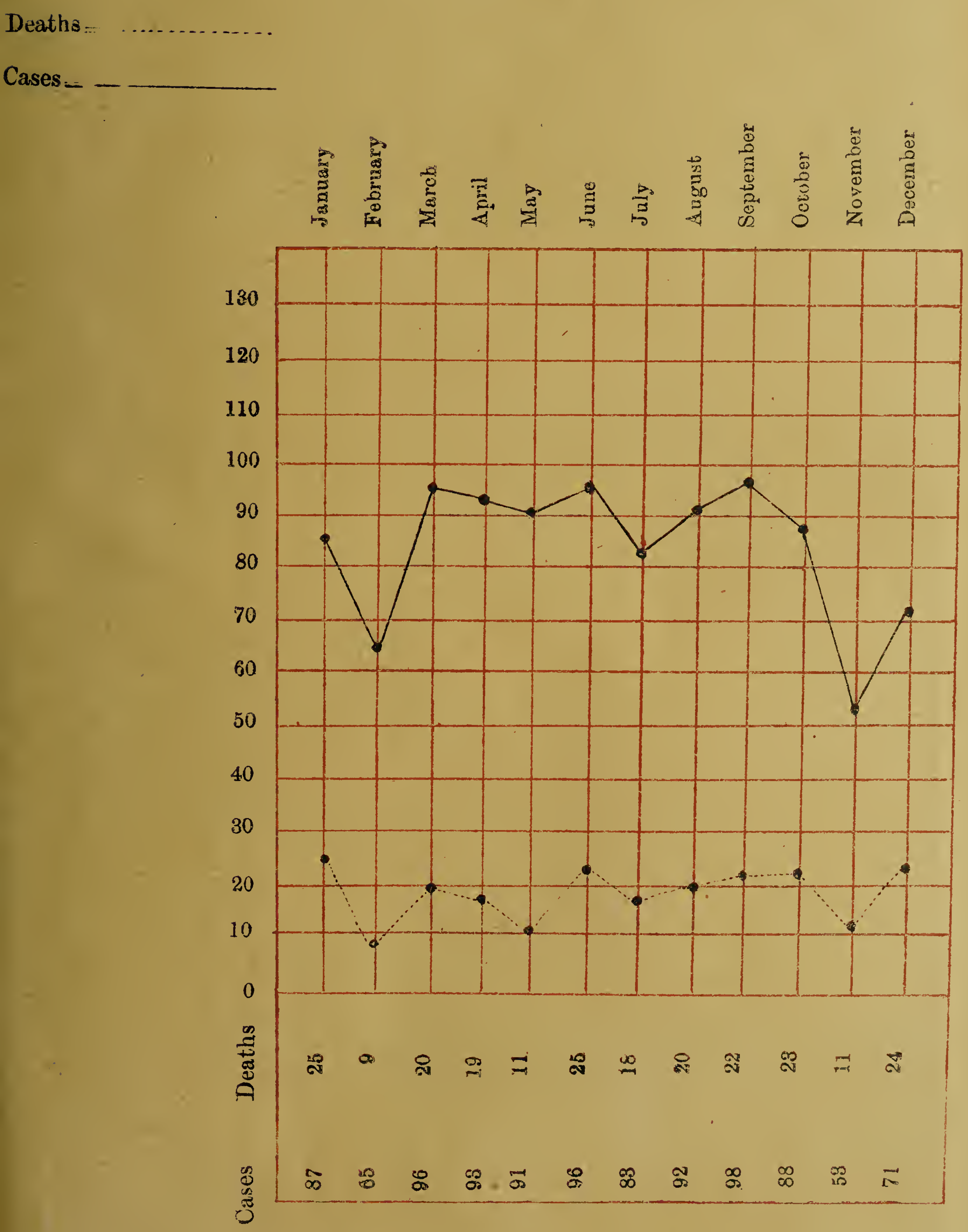

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CHART V.

Chapter IV, par. 5.

Chart showing monthly number of admissions for BRONCHITIS during 1904.

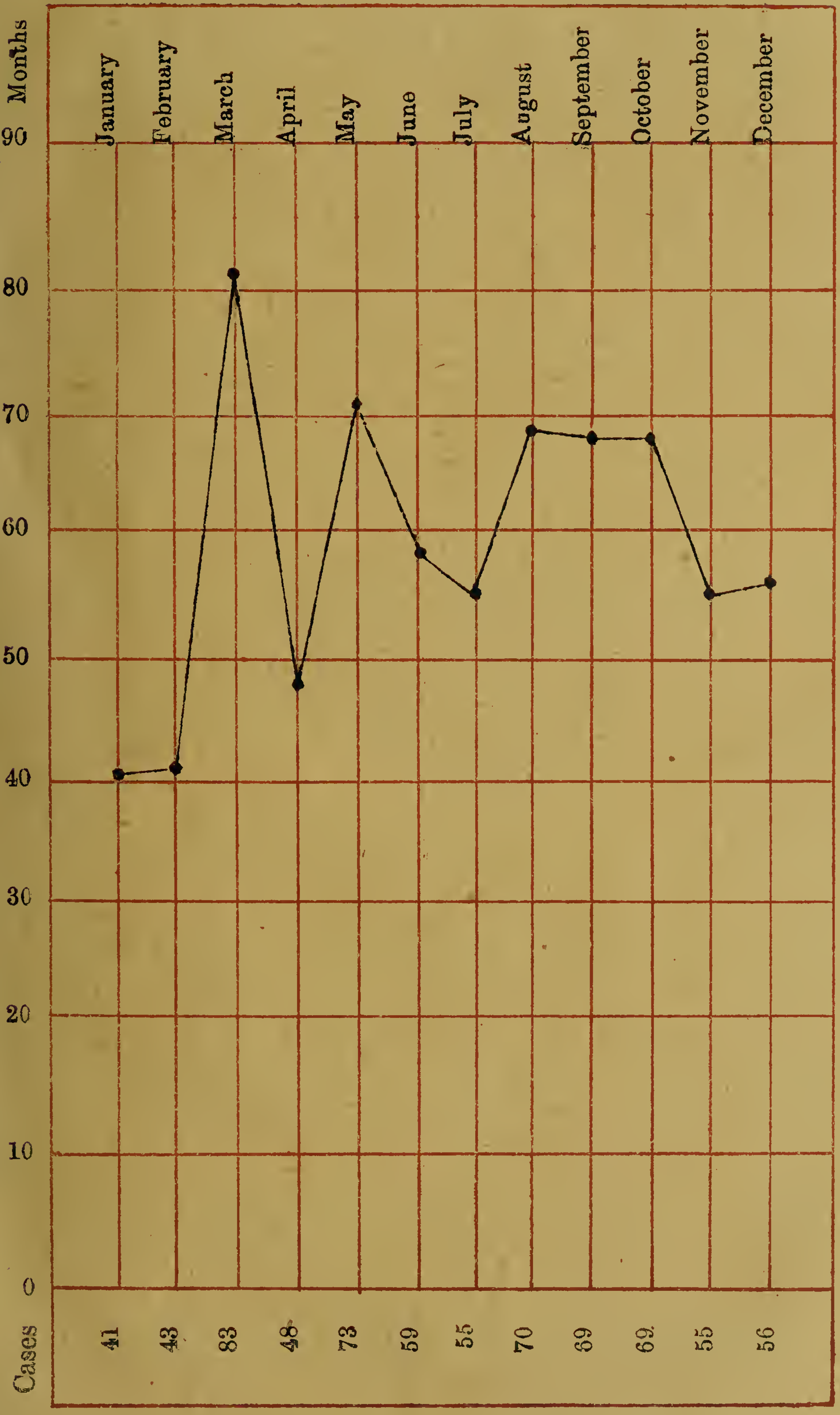

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CHART VII

CHAPTER IV. Para. 8

Chart shewing the monthly number of Plague cases detected from January 1902 to April 1905.

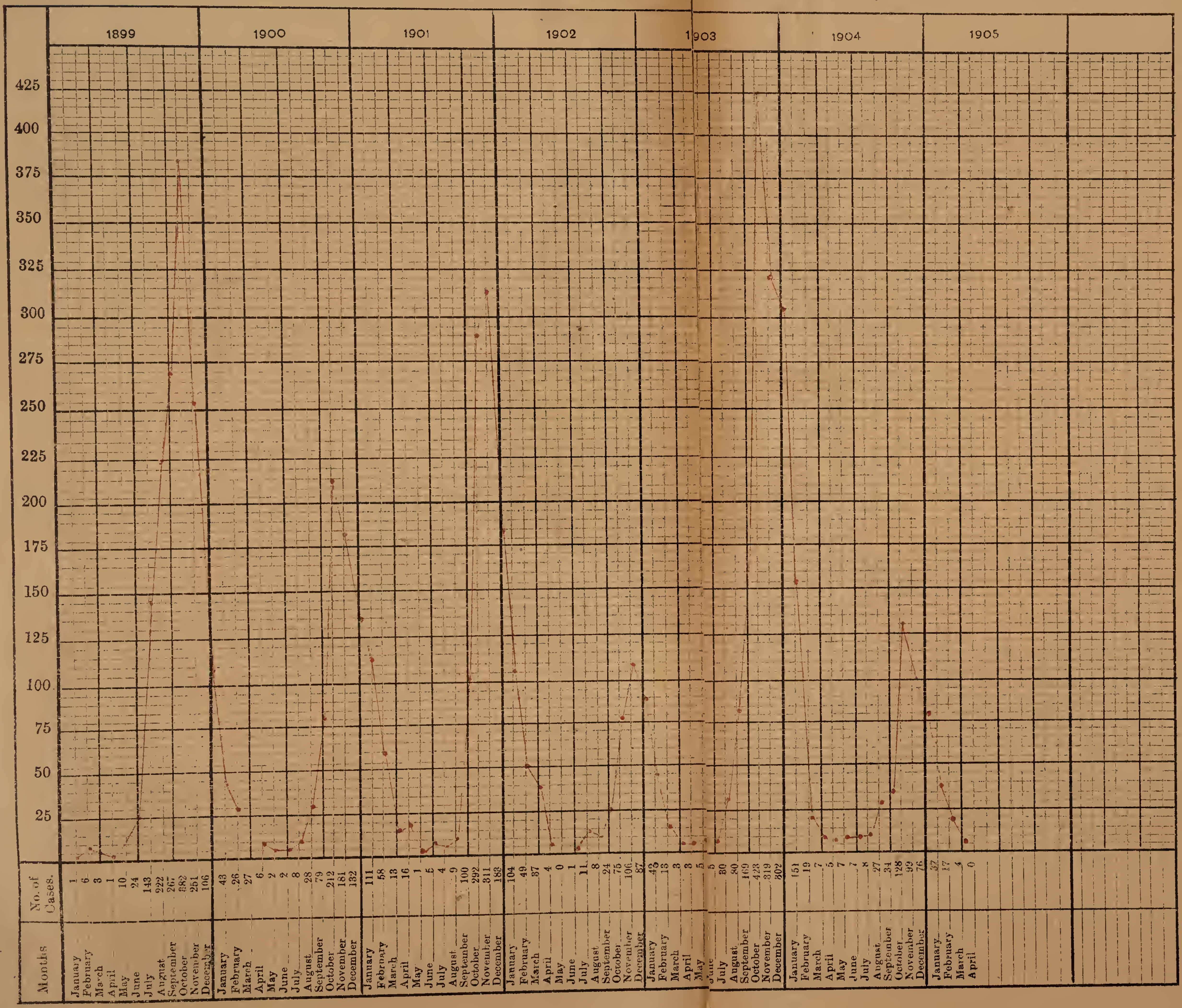

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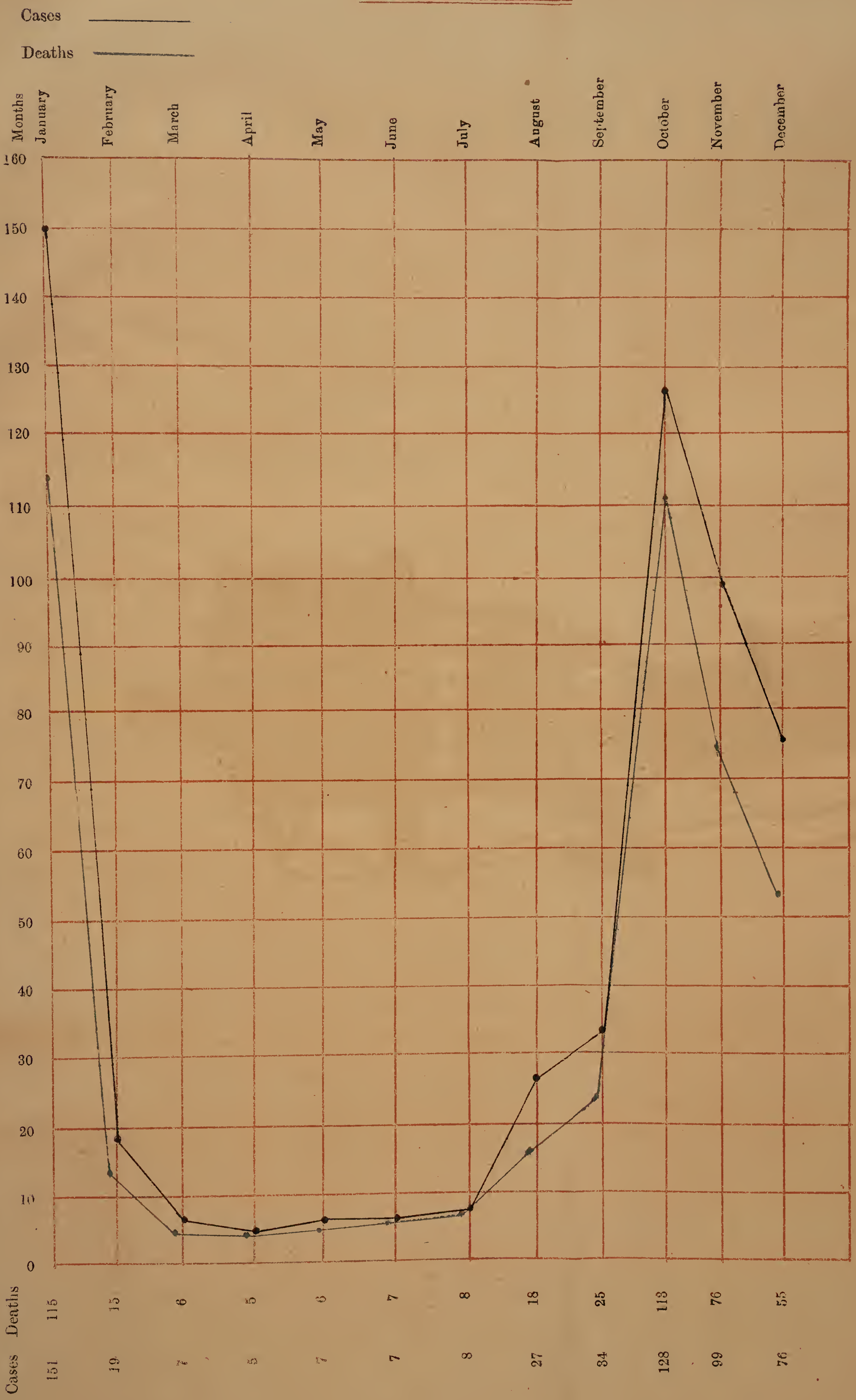
CHART VI.

Chapter IV, par. 8.

Chart showing the monthly number of PLAGUE cases which occurred in the Colony as well as the number of Deaths during the year 1904.



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9. I have, in last year's report, referred to the role played by rats in Mauritius in propagating the disease. Convinced by similar observations which he had made while more or less directly connected with preventive plague measures in previous years, the new Plague Authority, Dr. Blackburn, realized the necessity of waging an energetic campaign against the rodents and he has been unsparing in his efforts in this direction. This Medical Officer has succeeded by the various methods which will be found mentioned in his report, in course of preparation, to have no less than 27,620 rats caught in Port Louis between the months of May and December, while the destruction of this vermin has been extensively carried on at the same time by poison. A fair proportion of the rats captured was microscopically examined daily and the indications obtained from the detection of the bacillus in the infected ones were at once utilized by the Plague Authority for the disinfection without delay of premises before their occupiers had had time to be infected. The information obtained from these researches has besides confirmed the experience previously obtained from the occurrence of the epizootics that human plague generally follows within 2 to 4 weeks of the widespread infection of rats, and that the epidemic in any locality abates six to eight weeks after the cessation of the mortality among the rodents.

10. The efforts of the Sanitary Authorities to destroy rats in Port Louis were helped in May by a heavy downpour of rain which flooded part of the town.

11. Speedy and thorough disinfection was resorted to whenever suspicion of infection whether on the part of the Department or of private residents was aroused, but it is sad to record that for a not inconsiderable proportion of the population, experience, however bitter, is still of no avail and that not even perspective of immediate danger and, not in a few cases of death, will not awaken them to a sense of their responsibilities towards themselves and the public.

12. But, however thorough a disinfection may be, it cannot afford absolute protection in a great number of cases under the circumstances which hold locally as tumbling, ruinous houses with nooks and holes that cannot be reached are far too common. The spread of the disease is helped on the other hand by the prejudice of some against prophylactic measures, and by the deceit practised by many a member of certain sections of the population to escape the inconvenience of sanitary measures. Besides, the thorough disregard of anything sanitary, the fatalism imbibed from very childhood, constitute on the part of others serious obstacles in the way of opposing a successful fight to the disease which cannot but be deplored.

13. In spite of severe legislation with regard to the throwing of dead rats in the streets, in spite also of the almost daily warnings given of the danger of handling them and the necessity of resorting to precautions (disinfection and evacuation) whenever they are found, no heed is taken by the natives who consequently are almost the only ones to suffer.

14. Another baneful custom to which I might refer, is the habit still practised by many and encouraged by some, of hiding cases, or of only notifying them when too late. I should state that this habit prevails principally among Chinamen who in Port Louis are the grocers who supply the poorer classes, with what danger is apparent.

15. Table IV A gives the number of cases detected and the number of deaths for each month in each of the Districts. From that table it will be seen that the Districts which have suffered

most severely from the disease are those in which are the most important townships and villages, i.e. Port Louis with the capital, Plaines Wilhems with the towns of Rose Hill and Beau Bassin, and Curepipe, while Statement IV B shows in a tabular form the annual incidence of plague in each of the districts during the epidemic and quiescent periods of the disease since 1899.

16. At Curepipe, in October, plague broke out in an insidious form and escaped recognition at first. Within a few days 13 cases were reported, all of the pneumonic type and terminating fatally. On that occasion, one of the officers of this Department, Sanitary Inspector Casanove, contracted the disease probably in the course of a night visit to a patient affected with plague, in an ill ventilated hut. This unfortunate officer, in his turn, developed the same form of the disease and died within three days. This has been the unique instance of an officer of this Department contracting the disease. At the time of this outbreak, there was a well marked epidemic constitution of pulmonary complaints and the diagnosis between influenza and plague pneumonia was by no means easy to make at the outset of the sickness.

17. Yersinization of the contacts was carried out on a large scale in that town as these wished to take advantage of the new plague rules (Regulation No. 180 of 30.7.04) to avoid quarantine, but the system too liberally interpreted at first, proved ineffectual. When it was subsequently found that the disease got disseminated by panic-striken contacts from Curepipe, who fell ill at Moka, Savanne and Grand Port where they formed new foci of infection, recourse was had to removal to lazarets, and the outbreak was got under by the energetic measures then adopted under the immediate control of Dr. Castel who was placed in temporary charge of the locality. This focus gave rise to 40 cases distributed as follows :—

Curepipe	13
Moka	2
Flacq	3
Plaines Wilhems	9
Savanne	6
Grand Port	7
Total... ...	40

18. Though the Yersin serum proved inefficacious as preventive on that occasion, I must say that, employed in massive doses by Dr. Castel at the Lower Plaines Wilhems lazaret, it was apparently instrumental in saving the life of a few of the Curepipe contacts who developed plague in that lazaret.

19. At Flacq, Beau Champ Sugar Estate was twice affected, but the epidemic was soon got under, though a disturbance occurred in connection with the application of the prophylactic measures. No comments are made as the matter is *sub judice*.

20. Only six sugar estates were visited by the disease—a satisfactory point—to be explained perhaps by the readiness with which the responsible authorities have accepted and applied the precautionary measures, especially when rat mortality was noticed.

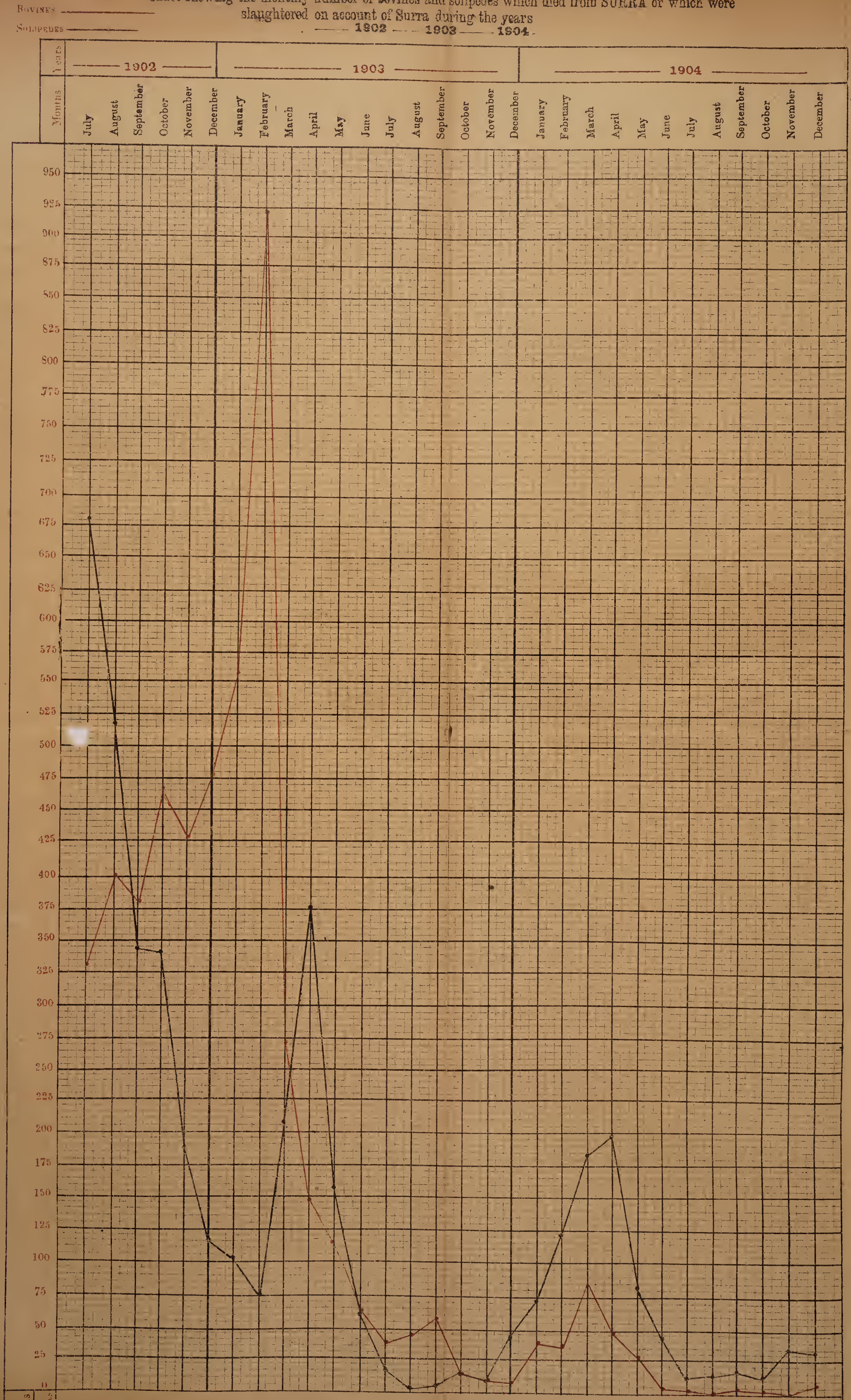
21. In the District of Grand Port, an outbreak occurred at the beginning of the year at New Grove. It threatened to assume a severe character at one time, but luckily its progress could be checked. The other Districts were comparatively unaffected by the scourge.

22. During 1904, Bois Savon and Grand River Lazarets in Port Louis, received 107 cases of which 65 proved fatal. The figures for Lower Plaines Wilhems Lazaret stand at 67 and 33

CHART VIII.

Chapter IV, par. 30.

Chart shewing the monthly number of bovines and solipedes which died from SURRA or which were slaughtered on account of Surra during the years 1902 — 1903 — 1904.



No. of Deaths	1902 July	August	September	October	November	December	1903 January	February	March	April	May	June	July	August	September	October	November	December	1904 January	February	March	April	May	June	July	August	September	October	November	December
Bovines	331	401	381	468	427	476	556	923	278	147	119	63	37	44	58	13	9	7	39	36	85	48	27	4	3	2	4	3	2	7
Solipedes	681	516	344	341	188	115	103	75	206	276	156	60	15	4	5	14	8	43	72	121	189	197	62	43	11	13	16	12	35	32

*NOTE—Figures prior to July 1903 not available

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respectively, while 16 patients were treated in the lazarets of Flacq, Grand Port and Savanne, of whom 10 died.

23. The case mortality of the lazarets including that of patients who sometimes died within a few hours of admission, has been 56.8 % which compares favourably with the death-rate for plague during the year which stands, as already stated, at 79.0 %.

24. With reference to treatment, the general lines have been rest, stimulants and, in the Lower Plaines Wilhems Lazaret, intravenous injection of Yersin serum in large doses. Great divergence of opinion still holds as to the last mentioned agent's value as prophylactic and curative.

25. The following table shows the number of cases of plague which have occurred in the two classes of contacts—yersinized and non yersinized—kept under observation or in segregation, in town, in Plaines Wilhems and in the other Country Districts during the year 1904 :—

	No. of contacts.	No. who developed plague.
Yersinized	261	31
Non Yersinized	1,708	32
Total	1,969	63

26. The following figures are also worth recording :— From June 1899 to June 1905, 3,407 contacts were admitted at the Lower Plaines Wilhems Lazaret, of these 1,044 were preventively injected with Yersin's serum and 21 or 2.01 % developed plague, while only 30 or 1.26 % among the 2,363 uninoculated subsequently suffered from the disease.

27. Some practitioners in Mauritius claim to have obtained with Yersin's serum remarkably good results which, they state, can be obtained by intravenous inoculation of large quantities of the serum at the earliest stage possible of the disease. That some good may result is not unlikely when Yersin's serum is used in large doses either subcutaneonsly or intravenously, but the question then arises whether the beneficial effect of the agent is due to any specific qualities acquired from its mode of preparation on the one hand, or simply to the physiological action of the *liquor sanguinis* which, from its nature and constitution, possesses intrinsic vital properties that strengthen the patient's personal resistance to the disease on the other. The problem is one which, under existing circumstances, cannot be solved in Mauritius, but will, I hope, at no distant date be fully elucidated by those equipped and qualified to express an authoritative opinion on the matter.

28. *Surra* :—The epizootic was noticed in the report for 1903, in Chapter VI, when special reference was made to Mr. Veterinary Surgeon Galloway's prophylactic and curative agent with which experiments were carried out at Grand River North West.

29. Before reporting further on these experiments it will be more convenient to refer to the epizootic of 1904.

Chart VIII. 30. The annexed chart gives the number of solipedes and bovines the deaths of which have been declared as due to surra or which have been slaughtered by order of the Sanitary Authorities in 1902, 1903 and 1904. It will be gathered from it that in 1904 the epizootic has been less virulent on both equines and bovines, but that the improvement is specially noticeable in the case of the latter. However, it must be, for the sake of accuracy, stated that the figures from which the chart has been prepared are not altogether in accordance with actual facts, as not a few owners will not notify the appearance of the disease on their herds from fear of being hampered in their work. Hence it is that, by even some of the better to do, the appearance of surra is not reported, and that deaths among cattle especially do not come to our notice. It must nevertheless be stated that the same conditions have been at work for the previous epizootics and that consequently, although the margin of error is not inconsiderable for 1904, it is not so great as to invalidate the conclusion that this year's outbreak has been less severe.

31. Allowance being made for the altered conditions of transport on sugar estates and the variations in the number of animals yearly imported in the Island, it seems possible to infer from the chart and from other known facts that surra has assumed a much less virulent type among cattle than equines, for the decrease in the number of deaths recorded for cattle in 1903 and 1904 is much more marked than the corresponding figures for equines during the same periods. The latter do not resist the disease while the former frequently recover naturally so long as they are placed under favourable conditions. These existed last year in respect of cattle which had not the same large amount of work to do as in 1903, owing to the shorter crop, which they did besides under better climatic conditions.

32. Reference will now be made to the continuation of the experiments undertaken in 1903 at Grand River North West in order to investigate the suggestions of Dr. Edington and the prophylatic and curative treatments of Mr. Veterinary Surgeon Galloway.

33. The value of each method, as ascertained by Mr. Maya and the late Mr. Veterinary Surgeon Deixonne respecting Dr. Edington's method, and Messrs. Maya and Galloway concerning the latter's method, has been fully exposed in my reports of 22. 2. 03 and 5. 10. 03 mentioned in last year's annual report.

34. On reference to them, it will be seen that from either the prophylatic or the curative points of view, the agent or means recommended have been found wanting ; but the experiments have shown that the disease can be harboured by bovines for a variable length of time and that, under favourable conditions, cattle possess a natural resistance to the disease.

35. Since, the animals experimented upon have been put to work and are, with the exception of one which, it is believed, died of accidental causes, in the best condition.

36. In February and May, blood was drawn from the bullocks and injected into rabbits. The results were :—

(a) The microscopical examination of the rabbits' blood proved negative as regards trypanosoma in every case,

(b) The February inoculation of bullocks' blood to rabbits did not give them the disease, but

(c) From that of May, acute surra was produced in the rabbits inoculated with blood from 4 of the bullocks,

(d) Two bullocks treated in the manner indicated by Dr. Edington have given on two occasions negative results on rabbits, thereby apparently confirming his opinion that injection of virulent surra blood may produce tolerance and recovery after a time,

(e) That a bullock which had, up to February last escaped the disease, since acquired it without any noticeable manifestation.

(f) That the virulence of the trypanosoma has lessened as it has taken a longer time to produce manifestations in the rabbits.

37. The above conclusions as well as the others already referred to will be fully gathered from the tabular statement annexed of the experiments carried ont.

V. SANITARY ADMINISTRATION.

Annexures VI & VII supply the usual tabular information on the work done by the staff of Sanitary Inspectors and Guards during 1904. It has been found convenient to follow the rule adopted in previous reports, of dealing separately with Port Louis and with the other districts taken together :—

Port Louis – The first table shows that 15,240 visits were paid by the Sanitary Officers to private premises in 1904. In addition to these 235 inspections were made of Common Lodging Houses and 1,997 of shops, markets, &c. They were called upon 1,091 times to perform special duties, carry out inquiries, attend cremations, exhumations and at the Morgue.

2. The Government Establishments, public and gratuitous private latrines, cemeteries, noxious factories, bakehouses, water courses and camps were the subject of 2,321 inspections. The manner in which the Scavengering service of the town was performed was checked on 1,187 occasions and 2,701 visits were paid to stables, pigstyes and cowsheds within the town and district.

3. During the same period, the number of Court attendances amounted to 405 and the staff were employed on quarantine duty for an aggregate total of 111 ½ days' work.

4. Contraventions of the Sanitary Regulations for defective latrine service or scavengering, sale of unsound food, &c., formed a total of 3,945 of which 283 had not been finally disposed of at the end of the year.

5. The Swine Destruction Ordinance continued to be applied by the Police throughout the year with fairly good effect. The number of pigs killed at Port Louis rose from 79 in 1903 to 227 and this action coupled with the infliction of a small fine by the Magistrate in cases in which the owners of the animals were known, have had an appreciable effect in reducing the nuisance caused by stray pigs in the outskirts of the town.

6. Little improvement has been noticeable in the scavengering service of urban Port Louis during the twelve months covered by this report. The streets and public places, the gutters and streams have been imperfectly and irregularly cleaned while a serious nuisance was created by the practice adopted by the Municipality of using Immigration Square as a depot for pressing and recarting the refuse from the central parts of the town.

7. In consequence of the coming into force of the New Municipal Ordinance, this Department has had to attend to the Scavengering Service of the extra urban portion of the District from the 1st. of March 1904. As no special provision has been made for that purpose, the work has been done with the means already at onr disposal. The Sanitary Band has proved very useful in that connection and furnished the necessary gangs of sweepers and scavengers and the service was carried on with the assistance of hired carts for the removal of the refuse and the donkey cart of the Department when available.

8. The latrine service has been performed under somewhat improved conditions. The difficulties with which the Night Soil Companies had to contend in 1903 as a resnlt of the surra epizootic, were overcome to such an extent as to permit of a gra-

dual return to the former mode of conveyance by cart, the last railway siding for the night soil traffic being closed in the latter part of the year. The duty of providing for the public and private latrine service in the true urban area was transferred to the town Council by the Municipal Ordinance of 1903, but, by agreement, the service of the public latrines was continued to be performed by the Government Contractor, the Municipality paying its own share. In the exercise of its new powers, however, the Town Council decided towards the close of the year that fourteen of the existing public latrines should be suppressed, a decision against which this Department has since protested.

9. The number of public nuisances referred to the Public Works Department or to the Municipality for abatement amounted to 807 of which 147 were still in existence at the end of the year. The number of notices served for removal of private nuisances amounted in the same period to 2,871.

10. The conditions under which water is supplied to the inhabitants of Port Louis have remained unaltered. In connection with this it seems a significant fact that 9 cases of typhoid fever have been notified to the local Sanitary Authority at Port Louis during the year under review.

11. Progress was made during the year with the scheme for the extension of the water carriage system to district No. 4 in the neighbourhood of the Line Barracks, 8,000 feet of underground sewers being constructed in that area while connections were established with a number of premises until then unprovided with water closets in the district already drained. The hope may be expressed that the works for draining the central area of town will not be much further delayed.

12. As already pointed out, certain changes were brought about in the sanitary management of Port Louis by the Municipal Ordinance No. 23 of 1903, which took effect on the 1st. of March 1904 whereby the respective responsibilities of the Health Department and the Municipality were considerably altered. Besides the care of the night soil and scavengering services, the Town Council has been entrusted with the charge of the gutters, streams and drains (except those under the management of the Drainage Authority) in the urban area. No material improvement in the condition of these channels can at present be reported.

13. The inspection of Common Lodging Houses and insanitary premises at Port Louis was continued by Dr. Keisler during the first half of the year. That Medical Officer having reverted to his titular appointment in the Immigration Department in June 1904, he was replaced by Dr. Sénèque who officiated as Assistant Sanitary Warden pending the appointment of a permanent titular to the post. The difficulties met with in endeavouring to bring about a much needed improvement in the housing of the poorer classes to which reference has been made in previous reports were not only still in existence in 1904 but were, if anything, intensified by the financial depression from which the Colony has suffered. Again, however commonplace the statement may appear, it cannot too often be repeated that a first step to secure the desired improvement should consist in the careful and stringent application of the provisions of the Building Ordinance in regard to the new buildings.

14. The milk trade received special attention, 1,353 samples being taken and tested by the Sanitary Officers. In cases where a doubt was felt as to the correctness of the view adopted by the examining Officer or when his opinion was contested by the seller, samples were submitted for chemical examination by the Government Analyst.

15. *Rural Districts* :—Annexure VII is a statement of the sanitary contraventions, collections, &c., in these districts during the year.

16. The number of contraventions was 1,067 for which 731 parties were prosecuted with fines amounting to Rs. 2,775.30 while 4,711 notices were served for the abatement of nuisances of which 327 had not been complied with when the year came to a close. 285 persons were prosecuted for non-compliance with notices and the fines imposed by the Courts amounted to an aggregate sum of Rs. 965.05.

17. The collections from markets and cemeteries in the charge of this Department amounted to Rs. 23,570.13.

18. The total number of animals killed in the four public Abattoirs under the management of this Department was 5,009.

19. The Estate Camps were reported to be fairly well kept except in the Districts of Grand Port and Savanne regarding which the reports from the local Sanitary Authority are not so favorable. On certain estates a serious nuisance is created by the presence of loose pigs in the camps. In the existing state of the law, the owners of the animals are responsible and the difficulty of identifying the guilty parties is in the vast majority of cases insurmountable, little assistance being as a rule obtained from the estate officials in that respect.

20. The enforcement of the Swine Destruction Ordinance has improved matters in villages where a similar nuisance existed, but that ordinance is of no avail in laborers' camps as it does not apply beyond the limits of towns and villages.

21. Ten new establishments of the class of noxious factories were authorised in 1904. Increasing attention is given to this question and great pains are taken to ensure that all trades and businesses capable of exercising an injurious influence on the public health should be carried out under adequate restrictions.

22. The following is a list of the newly authorised factories :

Bambara curing factories	4
Soap factory	1
Manure factories	2
Aloe-fibre factory	1
Limekiln	1
Distillery	1
Total	10

The district water supplies gave rise to fewer complaints, but the usual criticisms were heard regarding the Mare-aux-Vacoas water. The annually recurring pollution of the rivers and streams by the waste waters from the sugar mills also appear to have been generally speaking less extensive. Only three cases of illegal pollution were reported as against 15 in the previous year and in only one of these was the actual source of pollution discovered. The difficulty of establishing a contravention in such cases, in the present state of the law, has been pointed out in previous reports so that the number of contraventions is no criterium of the degree to which the water courses of the Colony are defiled by sugar house lees. The extent of the evil and the futility of the efforts made hitherto to mitigate it are only indications of the complexity of the problem. The remedy appears to reside in the discovery of some method of purifying these waters before their discharge into the streams.

23. In a contribution to the study of the modern methods of purification applicable to residual waters, published in 1904 in the " Annales de l'Institut Pasteur ", Dr. Calmette, of Lille,

referring to certain experiments that were being made by him, reports very favourably on the results already obtained by the treatment of waters from sugar factories by biological methods in contact beds. The long required remedy may therefore be at hand and we may look forward to much desired improvements in the conditions of our streams and rivers in crop time.

24. A number of rivers and streams were cleaned by this Department with a view to improve the water supplies of certain localities and good must also have been done in that direction by the works carried out at the request of the Malaria Committee and under the direction of the District Boards.

25. The scavengering and night soil services were performed under more favourable conditions with regard to the facilities of cartage. The Government contracts for these services were renewed in 1904 not only without difficulty but with an actual reduction in many cases in the prices previously paid. Advantage was taken of the renewal of the contracts to fix the obligations of the Contractors more clearly in certain respects and a contract was signed for Quartier Militaire village where no such agreement existed in the past. On the other hand, this Department was relieved of the duty of providing for the night soil service in the town of Curepipe, the Board of Commissioners of that town having fulfilled their legal obligations in that respect.

26. As in previous years, the Disinfecting Station at Plaine Lauzun was fully taken advantage of for the disinfection of contaminated articles both from Port Louis and the Districts. The Station has on the whole worked very smoothly and satisfactorily the principal calls upon it arising, as in the past, in connection with plague.

27. It has not been possible as yet to utilize the Harbour Disinfecting Station for the purpose for which it was mainly designed, but it has already proved useful for the disinfection of the effects of outward bound passengers.

28. Drs. Momplé and Milne, the two Sanitary Wardens appointed under Ordinance No. 53 of 1904, assumed the duties of their posts in the course of the year. Dr. Castel continued in Sanitary charge of Northern Plaines Wilhems, but Dr. Penaud who had for some time been connected with this Department as Additional Assistant Sanitary Warden, resigned his appointment and was replaced by Dr. Chevreau in the supervision of Curepipe and Southern Plaines Wilhems. The changes above referred to in the higher sanitary staff have naturally been attended with no inconsiderable disturbance of the routine work of the Department and they are of too recent date in so far as the fixed establishment is concerned, to permit of a definite opinion being expressed as to their results.

VI. VACCINATION.

10,524 children were vaccinated by the various Government Vaccinators during the course of the year. Of these, 268 were declared unsusceptible to successful vaccination. The percentage of success therefore stands at 97.45 %, a very gratifying result. The figure might have been still higher had not, in certain cases, the Medical Officers who issued certificates of unsusceptibility, vaccinated on the three occasions required by law with the same lymph as proved inefficacious on the first trial, through a misapprehension of the law and the insistance of the parents to obtain a certificate after the third failure. This failure is an indirect consequence of the Marseilles strike which prevented our supply of glycerinated calf lymph being received as usual by the

M. M. Steamers which carry it in the cold storage room in accordance with arrangements specially made. The lymph on those occasions was received by parcel post via Colombo and its inefficacy is attributable to the high temperatures to which it was subjected during the voyage.

2. The number of births for 1903 stands at 13,611 and that for 1904 at 14,103 so that the average for the two years is 13,857. The average percentage of infants born in Mauritius which have been successfully vaccinated by the Government Vaccinators may therefore be said to be 74.01 % but the real proportion of successful vaccinations is greater for no allowance has been made for the large number of infants which either died before being vaccinated or were vaccinated by private practitioners.

3. It may not be out of place in this connection to make the painful observation that it is mostly among the families belonging to the better classes that children often escape the law in the intervals of small-pox outbreaks.

VII. PUBLIC HOSPITALS & DISPENSARIES.

1. The number of Hospitals and Asylums, 12, including the Hospitals attached to the Port Louis and Beau Bassin Prisons and to the Government Reformatory, has remained unchanged.

2. The same remark applies to the number of Dispensaries of which there are 28 in the Colony, 14 fixed and 14 extra.

3. Of the 14 fixed Dispensaries, 6, those of Long Mountain, Poudre d'Or, Flacq, Mahebourg, Souillac and Beau Bassin are attached to the Hospitals of the locality.

4. The number of cases treated at the several Dispensaries amounted to 50,428, inclusive of minor surgical operations.

5. The following table gives the number of beds provided for male and female patients in the different Hospitals, as well as the number of admissions, discharges and deaths which have taken place in these Institutions during the year, and from which an opinion of the importance of the different Hospitals can be formed.

Hospitals.	No. of beds.	Remaining on 31 Dec.	Admissions.	Deaths.	Cases treated.	Discharged.
Civil	277	142	5,573	379	5,715	5,589
Port Louis Prisons...	25	7	780	8	787	784
Long Mountain ...	33	19	555	26	574	561
Poudre d'Or ...	55	27	1,039	36	1,066	1,039
Flacq	82	32	1,638	86	1,670	1,630
Grand Port ...	106	28	1,716	95	1,744	1,716
Savanne ...	72	40	1,096	62	1,136	1,126
Barkly Asylum ...	218	101	3,165	196	3,266	3,184
Lunatic Asylum ...	33	25	427	23	452	424
Beau Bassin Prisons.	47	13	817	19	830	812
Reformatory ...	10	3	42	4	45	45
Moka ...	54	7	644	39	651	638
Total ...	1,012	444	17,492	973	17,936	17,548

VIII.—MISCELLANEOUS.

Port and Quarantine Work.

During 1904, the Health Officer boarded 265 vessels. Forty refused communication with the shore and either performed their landing operations in quarantine or left immediately after they had received orders, 75 were placed in quarantine. This measure was imposed for disinfecting purposes only in 62 cases. Eleven steamers were detained for a period ranging from 10½ hours to 6 days to complete their period of quarantine as they came from infected ports within the incubation periods of the diseases for which that measure was ordered, but on two occasions the S.S. "Secunder" was kept in quarantine for 20 and 18 days respectively on account of the occurrence of small-pox on board.

2. Vaccination was performed, on both passengers and crew, in the case of 12 steamers coming chiefly from Indian Ports where their bills of health were annotated on account of the existence of small-pox.

3. Flat Island Quarantine Station was not occupied at all during the year under review.

4. Cannonniers' Point was placed in quarantine on four occasions, twice for quarantining the passengers of the S. S. "Secunder", in March and August, on account of the occurrence of small-pox on board, and twice to carry out measures of disinfection in the case of batches of Immigrants numbering 747 and 697 respectively.

Medico-legal and Chemical Analyses.

5. The Medico-legal work performed by the Government Analyst during the year under review will be found resumed in the annexed report of Dr. Paddle. The difficulties he complains of are besides enhanced by his having to superintend such a large Institution as the Lunatic Asylum. The desirability of having a special laboratory to control not only the supply of food stuffs but also of medicines imported, is very much felt.

Bacteriological work, &c.

6. The work done at the bacteriological laboratory has been already referred to in the foregoing pages and will be found more fully noticed in Dr. Rouget's report annexed. I am glad to concur in his appreciation of the services rendered by Mr. Maya.

7. It is highly gratifying to record that means will be provided at no distant date for the equipment and working of the Bacteriological Institute, the want of which has been brought to notice in several previous annual reports.

8. During the year under review Ordinances No. 51 of 1903-04, Nos. 6, 29, 35 & 38 of 1904 were promulgated. The first, which has modified in several important respects the constitution of the Department, was enacted in accordance with some of the recommendations of the Medical Reorganization Commission; but the other important modifications of Ordinance No. 32 of 1894-95 concerning the rural districts, suggested by the Commission, are still under consideration.

H. LORANS,

M.B.C.M., & D.P.H. EDIN.,
Director of the Medical & Health Department.

STATEMENT I.

STATISTICS OF POPULATION 1904.

	Europeans, Whites, Mixed & Coloured.	Africans.	Indians.	Chinese.	Total.
Number of inhabitants on 31.12.03 ...	104,426	2,432	262,770	5,016	374,644
„ Births during the year 1904.	4,038	...	10,065	...	14,103
„ Deaths „ „ 1904.	3,389	14	8,565	146	12,064
„ Immigrants „ 1904.	1,651	...	3,250	1,290	6,191
„ Emigrants „ 1904.	1,309	...	2,243	577	4,129
Number of inhabitants on 31.12.1904.	105,467	2,418	265,277	5,583	378,745
Increase or	1,041	...	2,507	567	4,101
Decrease	...	14	...	..	...

STATEMENT II.

METEOROLOGICAL RETURN 1904.

Months.	TEMPERATURE.						RAINFALL.		WINDS.		REMARKS.
	Solar Maximum.	Minimum on Grass.	Shade Maximum.	Shade Minimum.	Range.	Mean.	Amount in Inches.	Degree of Humidity.	General Direction.	Average Force.	
										Miles per hour.	
January ...	153.0	64.9	89.3	67.6	21.7	77.6	3.365	74.6	E	10.4	
February ...	152.8	66.0	89.9	70.4	19.5	78.7	4.915	78.1	E.b.N.	9.5	
March	154.2	60.8	87.3	67.8	19.5	76.9	13.210	79.6	E	11.1	
April	149.1	55.2	84.4	62.3	22.1	74.1	3.995	79.4	E.S.E.	8.8	
May	142.1	49.6	81.7	57.1	24.6	71.4	3.585	80.7	E.S.E.	8.0	
June	133.7	46.3	76.6	54.5	22.1	67.7	3.565	76.1	S.E.b.E.	9.4	
July	142.3	43.4	76.2	51.3	24.9	66.5	2.090	76.7	E.S.E.	9.8	
August ...	139.3	45.8	78.5	55.1	23.4	67.1	0.975	75.8	E.b.S.	9.8	
September ...	148.2	42.0	78.8	50.9	27.9	67.7	1.045	69.2	E.S.E.	10.1	
October ..	1 2.9	46.9	87.1	54.6	32.5	71.6	0.930	70.5	E.b.N.	9.4	
November ...	155.2	53.0	87.0	61.9	25.1	74.8	1.380	66.2	E.b.S.	10.0	
December ..	153.2	57.7	88.2	65.4	22.8	77.5	4.060	71.0	E.b.N.	8.9	
		Absolute values.						Totals.			
For the year.	155.2	42.0	89.9	50.9	32.5	72.6	43.115	74.8	E.b.S.	9.6	

RETURN OF DISEASES AND DEATHS.

HOSPITALS :—

1. Civil.
2. Port Louis Prisons.
3. Long Mountain.
4. Poudre d'Or.
5. Flacq.
6. Mahébourg.
7. Souillac.
8. Barkly Asylum.
9. Lunatic Asylum.
10. Beau Bassin Prisons.
11. Reformatory.
12. Moka.

STATEMENT III.

GENERAL DISEASES.

Diseases.		Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
			Admissions.	Deaths.			
Small Pox		...	...	...	...	...	
Chicken Pox		1	4	...	5	...	
Measles		...	1	...	1	...	
Scarlet Fever		...	...	...	...	...	
Dengue		...	...	...	...	...	
Cholera		...	...	...	...	...	
Yellow Fever		...	...	...	...	...	
Beriberi		3	13	3	16	...	
Yaws (Foot)		...	4	...	4	...	
Influenza		3	1,036	24	1,039	9	
Diphtheria		...	...	...	...	...	
Febricula		...	...	...	...	...	
Enteric Fever		3	15	5	18	1	
Dysentery		12	5 5	89	517	10	
Plague		...	54	22	54	...	
Malarial Fever:— (a) Intermittent	Quotidian	22	1,590	12	1,612	17	
	Tertian	...	121	2	121	2	
	Quartan	2	38	2	40	...	
	Irregular	7	237	...	244	...	
	Type undiagnosed	7	872	1	879	5	
(b) Remittent		5	159	11	164	2	
(c) Pernicious		...	22	9	22	...	
Hœmoglobinuric Fever		...	2	...	2	...	
Erysipelas		2	51	8	53	5	
Pyæmia		...	1	1	1	...	
Septicæmia		...	16	14	16	...	
Tetanus		...	7	4	7	1	
Tubercle		39	1,013	227	1,052	22	
Gonorrhœa		2	205	...	207	4	
Hydrophobia		...	...	...	...	...	
Scurvy		...	4	...	4	1	
Parotitis		...	3	...	3	...	
Carried over		108	5,973	434	6,081	79	

	Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
			Ad-missions.	Total.			
	Brought forward	108	5,973	434	6,081	79	
GENERAL DISEASES.	Pertussis	...	...	...	...	...	
	Rheumatic Fever	...	4	1	4	...	
	Rheumatism	11	489	1	500	16	
	Gout	...	3	...	3	...	
	Leprosy :—						
	(a) Tubercular	...	2	...	2	...	
	(b) Anaesthetic	...	4	...	4	...	
	(c) Mixed	...	...	...	...	...	
	Syphilis. —						
	(a) Inherited	..	7	...	7	...	
	(b) Primary	3	131	...	134	4	
	(c) Secundary	8	134	1	142	7	
	(d) Tertiary	5	80	2	85	6	
	Acoholism	1	13	...	14	...	
	Delirium Tremens	...	3	...	3	...	
	Anæmia	17	513	15	530	19	
	Debility	17	499	98	516	9	
	Diabetes Mellitus	1	29	2	30	...	
	Diabetes Insipidus	...	...	...	...	...	
	New Growth						
	(a) Non Malignant	...	61	...	61	3	
	(b) Malignant	...	50	11	50	1	
	Hœmophilia	...	2	...	2	...	
	Senectus	1	96	14	97	...	
	Other Diseases	1	...	...	1	...	
	Carried over	173	8,093	579	8,266	144	

LOCAL DISEASES.

Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
		Admissions.	Deaths.			
Brought forward	173	8,093	579	8,266	144	
Diseases of the Nervous System :—						
Section 1 :—						
Neuritis ...	...	6	...	6	...	
Meningitis ...	1	16	14	17	...	
Myelitis ...	...	10	...	10	...	
Locomotor Ataxia ...	...	13	...	13	...	
Hydrocephalus ...	...	1	...	1	...	
Encephalitis ...	...	1	1	1	...	
Congestion of Brain ...	...	12	3	12	1	
Abscess of Brain ...	...	1	1	1	...	
Cerebral Hœmorrhage ...	...	13	8	13	1	
Section 2 :—						
Paralysis ...	4	44	1	48	2	
Epilepsy ...	4	55	...	59	1	
Chorea ...	...	2	...	2	...	
Neuralgia ...	...	108	...	108	...	
Torticollis ...	...	2	...	2	...	
Hysteria ...	2	12	...	14	...	
Section 3 :—						
Idiocy ...	1	11	...	12	1	
Mania ...	...	28	...	28	...	
Melancholia ...	...	3	...	3	...	
Dementia ...	...	7	...	7	...	
Delusional Insanity ...	...	...	...	...	...	
General Paralysis ...	...	...	...	...	...	
Other Diseases of the Nervous System.	1	25	2	26	...	
Carried over ...	186	8,463	609	8,649	150	

LOCAL DISEASES.

Diseases.	Remaining at end of 1903.	Yearly Total		Total cases treated.	Remaining at end of 1904.	Remarks.
		Admissions.	Deaths.			
Brought forward ...	186	8,463	609	8,649	150	
Diseases of the Eye :—						
Conjunctivitis ...	1	56	...	57	2	
Keratitis ...	2	41	...	43	...	
Iritis ...	1	13	...	14	1	
Retinitis ...	...	8	...	8	...	
Cataract ...	5	81	...	86	4	
Ophthalmia Tarsi ...	1	22	...	23	1	
Staphyloma ...	1	9	...	10	...	
Other Diseases ...	...	30	...	30	1	
Diseases of the Ear :—						
Otitis ...	...	16	...	16	1	
Necrosis ...	...	2	...	2	...	
Abscess ...	...	14	...	14	...	
Otorrhœa ...	...	2	...	2	...	
Diseases of the Nose :—						
Epistaxis ...	...	1	...	1	...	
Rhinitis ...	...	3	...	3	...	
Inflammation of accessory sinuses...	1	...	...	1	...	
Diseases of the Circulatory System :—						
Pericarditis ...	...	1	1	1	...	
Hypertrophia Cordis ...	...	18	5	18	...	
Valvular diseases ...	7	219	52	226	7	
Aneurysm ...	...	4	...	4	...	
Phlebitis ...	...	1	...	1	...	
Arterio Sclerosis ...	...	11	1	11	...	
Other Diseases ...	...	7	...	7	...	
Carried over ...	205	9,022	668	9,227	167	

	Diseases.	Remaining at end of 1903.	Yearly Total.		Total Cases Treated.	Re-maining at end of 1904.	Remarks.
			Admis-sions.	Deaths.			
	rought forward	205	9,022	668	9,227	167	
Local Diseases.	Respiratory System :—						
	Asthma ...	2	143	...	145	2	
	Laryngitis ...	1	7	...	8	...	
	Bronchitis ...	12	721	12	733	12	
	Pneumonia ...	3	334	72	337	11	
	Pleurisy ...	1	40	1	41	1	
	Hœmoptysis ...	...	6	...	6	...	
	Other Diseases ...	...	9	2	9	...	
Local Diseases.	Digestive System :—						
	Stomatitis ...	...	53	1	53	8	
	Tonsillitis ...	1	27	...	28	...	
	Dyspepsia ...	2	123	...	125	4	
	Gastritis ...	3	64	...	67	...	
	Gastralgia ...	...	22	...	22	...	
	Ulcus Ventriculi ...	...	1	1	1	...	
	Enteritis ...	1	174	14	175	3	
	Appendicitis ...	...	8	1	8	...	
	Hernia ...	...	54	...	54	...	
	Hœmorrhoids ...	2	56	...	58	...	
	Fistula in Ano ...	...	20	...	20	...	
	Hepatitis ...	...	46	...	46	...	
	Cirrhosis of Liver ...	1	49	5	50	3	
	Suppuration of Liver ...	3	27	14	30	1	
	Biliary Calculus ...	...	9	...	9	...	
	Peritonitis ...	...	13	11	13	...	
	Diarrhœa ...	12	382	30	394	16	
	Colic ...	...	34	...	34	...	
	Constipation ...	...	22	...	22	1	
	Carried over ...	249	11,466	832	11,715	229	

	Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
			Admissions.	Deaths.			
	Brought forward	249	11,466	832	11,715	229	
LOCAL DISEASES	Digestive System :—(*Continued*).						
	Other Diseases ...	4	62	2	66	4	
	Lympathic System :—						
	Splenitis ...	...	22	...	22	...	
	Hypertrophia Splenis ...	7	373	21	380	13	
	Adenitis ...	1	82	...	83	1	
	Lymphangitis ...	2	39	1	41	1	
	Lymphangiectasis ...	...	3	...	3	...	
	Urinary System :—						
	Nephritis ...	5	252	44	257	9	
	Pyelitis ...	...	1	1	1	...	
	Cystitis ...	2	64	1	66	2	
	Calculus ...	...	5	...	5	...	
	Other Diseases ...	...	17	1	17	...	
	Carried over ...	270	12,386	903	12,656	259	

Diseases.	Remaining at end of 1903.	Yearly Total.		Total Cases Treated.	Remaining at end of 1904.	Remarks.
		Admissions.	Deaths.			
Brought forward	270	12,386	903	12,656	259	
LOCAL DISEASES.						
Diseases of the Generative System :—						
(a) *Male Organs.*						
Balanitis ...	...	6	...	6	...	
Phimosis ...	1	18	...	19	...	
Paraphimosis ..	1	18	...	19	...	
Stricture of Urethra ...	3	43	1	46	...	
Prostatitis ...	...	4	...	4	...	
Ulcus Veneris Molle ...	7	70	...	77	2	
Hydrocele ...	2	69	...	71	...	
Orchitis ...	2	56	1	58	...	
Other Diseases ...	6	37	...	43	1	
(b) *Female Organs.*						
Oöphoritis ...	...	6	...	6	...	
Parametritis ...	...	4	...	4	...	
Endometritis ..	...	22	...	22	1	
Displacement of Uterus ...	1	19	...	20	...	
Vaginitis ...	...	14	...	14	...	
Amenorrhœa ...	...	9	...	9	...	
Dysmenorrhœa ...	...	1	...	1	...	
Menorrhagia ...	...	6	...	6	...	
Metrorrhagia ...	...	11	...	11	...	
Leucorrhœa ...	...	3	...	3	...	
Mastitis ...	...	3	...	3	1	
Abscess of Breast ...	1	11	...	12	...	
Other Diseases ...	2	13	...	15	1	
Carried over ...	296	12,829	905	13,125	265	

	Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
			Admissions.	Deaths.			
	Brought forward	296	12,829	905	13,125	265	
LOCAL DISEASES.	Affections connected with Pregnancy :—						
	Abortion ...	...	13	...	13	...	
	Hæmorrhage ...	...	...	...	...	...	
	Other Affections ...	...	24	1	24	...	
	Affections connected with Parturition .—						
	Inertia ...	...	2	...	2	...	
	Dystocia ...	...	...	...	...	...	
	Post partum Hæmorrhage ...	...	1	1	1	...	
	Pelvic Cellulitis ...	...	...	...	...	...	
	Gangrene of Vagina ...	...	1	1	1	...	
	Diseases of the Organs of Locomotion :—						
	Osteitis ...	...	5	...	5	2	
	Periostitis ...	...	4	...	4	...	
	Caries ...	2	26	1	28	1	
	Necrosis ...	2	24	...	26	2	
	Synovitis ...	3	15	...	18	1	
	Arthritis ...	4	28	...	32	2	
	Ankylosis ...	...	3	...	3	...	
	Ganglion ...	...	...	...	...	...	
	Other Diseases ...	...	11	1	11	...	
	Carried over ...	307	12,986	910	13,293	273	

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	Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
			Admissions.	Deaths.			
	Brought forward ...	307	12,986	910	13,293	273	
LOCAL DISEASES.	Diseases of the Cellular Tissue :—						
	Cellulitis & Abscess ...	21	540	7	561	22	
	Gangrene ..	4	31	10	35	3	
	Other Diseases. ...	...	8	...	8	...	
	Diseases of the Skin :—						
	Erythema ...	...	2	...	2	...	
	Eczema ...	5	144	...	149	3	
	Impetigo ...	5	113	...	118	9	
	Psoriasis ...	...	4	...	4	...	
	Herpes ...	...	20	...	20	...	
	Zona ...	1	2	...	3	...	
	Pemphigus ...	...	4	...	4	...	
	Carbuncle ...	1	19	...	20	1	
	Furunculus ...	1	20	...	21	...	
	Paronychia ...	...	16	...	16	...	
	Lupus ...	...	2	...	2	...	
	Ulcus ...	36	478	...	514	7	
	Ecthyma ...	2	26	...	28	...	
	Tropical Sloughing Phagedæna ...	...	852	2	852	8	
	Other Diseases ...	1	17	...	18	...	
	Carried over ...	384	15,284	929	15,668	326	

Diseases.	Remaining at end of 1903.	Yearly Total		Total cases treated.	Remaining at end of 1904.	Remarks.
		Admissions.	Deaths.			
Brought forward	384	15,284	929	15,668	326	
Injuries ;—						
(a) *General.*						
Burns	...	9	4	9	1	
Lightning Stroke	...	...	...	...	...	
Asphyxia	...	2	2	2	...	
Shock from :—						
Sunstroke	...	1	...	1	...	
(b) *Local.*						
Burns & Scalds	5	46	8	51	2	
Bruise	2	319	...	321	5	
Wound	20	568	9	588	15	
Sprain	1	13	...	14	...	
Dislocation	...	19	...	19	...	
Fracture	15	122	6	137	13	
Gunshot Wound	1	20	2	21	...	
Other Injuries	...	11	4	11	...	
Carried over	428	16,414	964	16,842	362	

Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
		Admissions.	Deaths.			
Brought forward ...	428	16,414	964	16,842	362	
Malformations :—						
Head ...	...	...	...	...	...	
Thorax .	...	...	...	...	...	
Abdomen ...	...	1	...	1	...	
Upper Limb ...	...	...	...	...	...	
Lower Limb ..	...	...	...	...	...	
Poisons :—						
Mineral ...	...	3	...	3	...	
Vegetable ...	...	1	...	1	...	
Animal ...	...	1	...	1	...	
Organic ...	...	1	1	1	...	
Parasites (*animal*) :—						
Tape Worms ...	...	4	...	4	...	
Round Worms ...	...	83	1	83	1	
Tread Worms ...	...	...	...	...	...	
Bilharzia Hœmatobia ...	...	15	...	15	...	
Filariasis :—						
Elephantiasis ..	2	17	1	19	...	
Chyluria ...	...	5	...	5	...	
Ankylostoma ...	...	14	...	14	1	
Itch ...	5	265	...	270	4	
Apthœ ...	...	2	...	2	...	
Not specified* ...	8	568	6	576	19	
Parturition (*Uncomplicated*) ...	1	98	...	99	1	
Total ...	444	17,492	973	17,936	388	

* Includes mothers admitted with their sick children and vice versa, malingering, &c.

SUMMARY.

Diseases.	Remaining at end of 1903.	Yearly Total.	Total cases treated.	Remaining at end of 1904.	Remarks.
		Admissions.			
General Diseases ..	173	8,093	8,266	144	
Diseases of the Nervous System ...	13	370	383	6	
" Eye ...	11	260	271	9	
" Ear ...	...	34	34	1	
" Nose ...	1	4	5	...	
" Circulatory System ...	7	261	268	7	
" Respiratory System ...	19	1,260	1,279	26	
" Digestive System ...	29	1,246	1,275	36	
" Lymphatic System ...	10	519	529	15	
" Urinary System ...	7	339	346	11	
" Generative System ...	26	443	469	6	
" Organs of Locomotion ...	11	116	127	8	
" Cellular Tissue ...	25	579	604	25	
" Skin ...	52	1,719	1,771	28	
Injuries ...	44	1,130	1,174	40	
Malformations ...	...	1	1	...	
Parasites ...	7	405	412	6	
Poisons ...	...	6	6	...	
Not specified ...	8	568	576	19	
Parturition (Uncomplicated) ...	1	98	99	1	
Affections connected with Pregnancy and Parturition ...	...	41	41	...	
Total ...	444	17,492	17,936	388	

Return of Births.

	Number	Deaths	Remarks.
Born alive at term	74	1	
Prematurely born	17	10	
Still born	15		
Total	106	26	

RETURN OF SURGICAL OPERATIONS.

Operations.	Number.	Deaths.	Remarks.
Operations for Tumours ...	25	1	
,, Evacuation of Abscesses ...	435	4	
,, Removal of Foreign bodies ...	8	...	
Operations on Blood vessels ..	3	...	
,, Lymphatic Glands ...	11	...	
,, Skin and Subcutaneous tissues	57	...	
,, Bones ...	36	2	
,, Nerves ...	...	...	
,, Joints ...	21	...	
,, Muscles and Tendons ...	8	...	
,, Skull and Brain ...	2	1	
,, Eye ...	52	...	
,, Ear ...	2	...	
,, Head and Face ...	14	...	
,, Chest ...	10	...	
,, Abdominal cavity ...	83	4	
,, Liver ...	24	10	
,, Spleen ...	...	...	
,, Rectum and anus ...	15	...	
,, Urinary System ...	66	1	
,, Male Generative organs ...	142	...	
,, Female Generative organs ...	10	...	
Amputations ...	55	6	
Obstetric operations ...	12	...	
Other operations ...	35	...	
Total ...	1,126	29	

Return of Mental Diseases treated at the Lunatic Asylum, 1904

Diseases.	Remaining at end of 1903.	Yearly Total.		Total cases treated.	Remaining at end of 1904.	Remarks.
		Admissions.	Deaths.			
Idiocy	8	8	5	16	9	
Mania	196	77	9	273	*208	
Melancholia	23	16	4	39	*26	
Dementia	122	13	5	135	121	
Delusional Insanity	50	2	...	52	51	
General Paralysis	...	...	...	...	...	
Total ...	399	116	23	515	415	

* Including one patient who absconded.

H. LORANS,

Director.

STATEMENT IV A.

Statement showing the number of plague cases and mortality among them during the year 1904.

DISTRICTS.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.		Percentage mortality.
	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured.	Died.	
Port Louis ...	16	38	...	5	...	2	...	3	...	2	...	2	...	7	3	12	8	17	8	82	14	63	7	38	56	271	82.9
Pamplemousses ...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	6	5	...	...	...	...	...	1	...	...	6	13	68.4
Rivière du Rempart ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Flacq ...	...	9	1	...	...	...	...	1	...	...	...	...	...	...	...	...	1	1	...	1	2	2	...	6	4	20	83.3
Grand Port ...	6	10	1	1	...	...	...	...	...	...	...	5	...	1	...	...	...	...	...	6	...	...	...	1	7	24	77.4
Savanne ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	8	...	...	...	...	3	9	75
Plaines Wilhems ...	10	49	2	9	...	4	...	1	1	4	...	...	...	...	...	1	...	4	5	16	7	10	12	10	37	108	74.5
Black River ..	2	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	3	3	50
Moka ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	...	3	1	33.3
Totals ...	36	115	4	15	1	6	...	5	1	6	...	7	...	8	9	18	9	25	15	113	23	76	21	55	119	449	79
No. of cases detected...	151		19		7		5		7		7		8		27		34		128		99		76		568		

H. LORANS,

Director.

STATEMENT IV B.

Statement showing Plague Incidence and death-rate since 1899.

A. Epidemic period. B. Quiescent stage.

		January to May 1899.		June 1899 to March 1900		April to July 1900.		August 1900 to March 1901.		April to August 1901.		Sept. 1901 to March 1902.		April to August 1902.		Sept. 1902 to March 1903.		April 1903 to June 1903.		July 1903 to February 1904.		March to July 1904.		August 1904 to March 1905.	
		Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died
	Port Louis ...	...	...	172	698	...	...	94	334	...	...	180	593	...	...	62	213	...	...	211	769	...	...	41	240
	Pamplemousses ...	...	..	24	88	...	...	30	74	...	...	14	26	...	...	...	3	...	...	3	16	...	...	6	6
	Riv : du Rempart ...	...	...	32	99	...	...	57	108	...	...	26	43	...	...	...	...	...	...	1	6	...	...	...	...
	Flacq ...	...	...	2	1	...	...	6	15	...	...	14	32	...	...	...	...	...	...	24	27	...	...	3	13
A.	Grand Port ...	...	...	3	2	...	...	5	11	...	...	2	2	...	...	1	1	...	...	17	43	...	...	4	13
	Savanne ...	...	...	15	63	...	...	6	7	...	...	1	3	...	...	...	1	...	...	12	16	...	...	1	9
	Plaines Wilhems ...	...	...	68	207	...	...	21	91	...	...	55	84	...	...	24	44	...	...	106	234	...	...	27	54
	Black River ...	...	...	...	5	...	...	...	3	...	...	..	...	...	...	...	...	...	...	2	5	...	...	...	1
	Moka ...	...	...	3	9	...	...	1	1	...	...	...	1	...	...	1	1	...	...	...	1	...	...	3	3
				319	1,172			220	644			292	784			88	263			376	1,117			85	339
	Total No. of cases...			1491				864				1,076				351				1,393				424	
	Death rate % ...			78.6				74.5				72.9				74.9				77.8				80	
	Port Louis ...	3	16			...	10			4	9			1	12			...	7			...	16		
	Pamplemousses ...	...	2			...	...			1	6			...	3			...	...			...	...		
	Riv. du Rempart ...	...	...			...	...			...	1			...	...			...	...			...	...		
	Flacq ..	...	...			...	...			...	...			...	...			...	...			...	1		
B.	Grand Port ...	...	...			...	...			...	...			...	...			...	...			...	6		
	Savanne ...	...	...			...	...			...	...			...	...			...	...			...	...		
	Plaines Wilhems ...	...	...			3	5			...	4			2	6			2	4			1	9		
	Black River ...	...	...			...	...			...	...			...	...			...	...			1	...		
	Moka ...	...	...			...	...			...	...			...	...			...	...			...	...		
		3	18			3	15			5	20			3	21			2	11			2	32		
	Total No. of cases...	21				18				25				24				13				34			
	Death rate %...	85.7				83.3				80.				87.5				84.6				94.1			

H. LORANS,
Director.

STATEMENT V.

Tabular Statement shewing the principal facts of the Experiments undertaken to investigate surra in Bullocks at Grand River N.W. from February 1903 *to July* 1904.—*Series A.**

Serial No. of Bullock.	Date and Dose of injection with Surra blood.	Date on which infection was ascertained microscopically and clinically.	Date of subsequent examinations.	Results of A Microscopical examination.	Results of B Inoculation Experiments (inoculation of blood into Rabbit).	Serial number of Rabbit inoculated.	
I	14.2.03	18.2.03	13.7.03	Negative	Positive	7	Rabbit showed rise of temperature on 6th day, Trypanosoma in its blood on 23rd day and died on 46th day.
	100c.c. intravenously.		6.2.04	do.	Negative	26	
	100c.c. subcutaneously.		28.5.04	do.	do.	41	
III	14.2.03	25.2.03	13.7.03	Negative	Positive	8	Rabbit showed rise of temperature on 25th day, Trypanosoma on 41st day and died on 71st day.
	200c.c. subcutaneously.		6.2.04	do.	Negative	27	
			28.5.04	do.	do.	42	
V	Never injected.	25.2.03 naturally infected.	13.7.03	Negative	Negative	9	
			10.8.03	do.	Positive	12	Rabbit showed rise of temperature on 8th day, Trypanosoma on 30th day and died on 48th day.
			6.2.04	do.	Negative	28	
			28.5.04	do.	Positive	43	This rabbit only showed rise of temperature on the 26th day. Trypanosoma were in its blood on the 32nd day and the rabbit died on the 46th.
VI†	do.	do.	13.7.03	do.	Negative with 2 c.c.	10	Rabbit showed rise of temperature on 4th day, Trypanosoma in its blood 16th day, died 21st day.
			10.8.03	do.	Positive with 4 c.c.	11	

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* These experiments were carried out for the Medical and Health Department by Mr. Maya, Pharmacist of the Civil Hospital, and Mr. R. Deixonne V.S.; to investigate certain suggestions made by Professor Edington.

† This bullock was slaughtered on 24.10.03 as it appeared too weak and thin to be sent to work. The autopsy disclosed no pathological lesions of any organ. The microscopical Examination of the blood taken at various periods before and after death, at no time showed any trypanosoma. Inoculations made into rabbits with blood, pericardial liquid, gland tissue and bone marrow did not give rise to any infection. The microscopical Examination of the same liquids and tissues also gave negative results. The animal might have been declared healthy and cured, judging from these facts, had not further knowledge of the unreliability of any of these methods, as an absolute proof of recovery, been obtained by the more recent experience of May last in the case of the control Bullock No. V which was its fellow.

H. LORANS,

Director.

14th. August, 1904.

STATE-

Tabular Statement showing the principal facts of the Experiments undertaken to

No. of Bullock.	Date and Dose of prophylactic injection with Galloway mixture.	Date and Dose of injection with Surra blood.	Date when infection was ascertained microscopically and clinically.	Date and Dose of curative injection with Galloway Mixture.	Dates of Examinations.
I	20. 7.03	8. 8·03	11. 8.03	22. 8.03	2. 9.03
"	20 c. c.	10 c. c.		20 c. c.	6. 2.04
"					28. 5.04
II	20. 7.03	Not injected ...	Vide remarks.	...	2. 9.03
"	40 c. c.				6. 2.04
"					28. 5.04
III	20. 7.03				2. 9.03
"	30 c. c.				6. 2.04
"	22. 8.03	Not injected ...	26. 8 03	...	
"	50 c. c.				
IV	20. 7.03	8. 8.03	11. 8.03	22. 8.03	2. 9.03
"	50 c. c.	20 c. c.		20 c. c.	6. 2.04
"					28. 5.04
V	Not injected ...	Not injected ...	...	...	2. 9.03
"					6. 2.04
"					28. 5.04
VI	Not injected ...	8. 8.03	11. 8.03	22. 8.03	2. 9.03
"				20 c. c.	6. 2.04
					28. 5.04

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* These experiments were carried out for the Medical and Health Department by Mr. Maya, pharmacist of the Civil Hospital, and Mr. Galloway, Veterinary Surgeon.

MENT V.

investigate surra in Bullocks at Grand River N. W. from July 1903 *to July* 1904. *Series B.**

Results of		Serial number of rabbit inoculated.	Remarks.
A. Microscopical Examination.	B. Inoculation Experiments (inoculation of blood into Rabbit.)		
Negative	Positive	16	Rabbit showed rise of temperature on 11th day, Trypanosoma in its blood on 12th day.
Negative	Negative	20	
do.	do.	36	
Negative	......	...	
Negative	Negative	21	This bullock had apparently contracted the disease naturally since February 1904.
do.	Positive	37	Rabbit showed rise of temperature on 21st day; Trypanosoma in its blood on 34th day, died on 53rd day.
Positive	......	...	
Negative	Negative	22	This bullock was found dead in May in the fields near some "Ipeca Sauvage" plants apparently accidentally poisoned.
Positive	Positive	17	Rabbit showed rise of temperature on 8th day; Trypanosoma on 19th day.
Negative	Negative	23	
do.	Positive	38	Rabbit only showed rise of temperature on 18th day, Trypanosoma in its blood on 33rd day and died on 59th day.
Negative	......	...	
Negative	Negative	24	Control animal, so far appears healthy and not infected.
do.	do.	39	
Negative	Positive	18	Rabbit showed rise of temperature on 10th day, Trypanosoma in blood on 11th day.
Negative	Negative	25	
do.	Positive	40	Rabbit only showed rise of temperature on 21st day Trypanosoma in its blood on 34th day and died on 53rd day.

H. LORANS,

14th. August 1904.

Director.

Annual Report on the Civil Hospital for 1904.

1. There was in 1904 a marked decrease in the number of admissions as compared with the two preceding years.

The following table gives the admissions and deaths for the last 10 years.

TABLE I.

Years.	Admissions.	Deaths.
1895	4937	350
1896	5117	372
1897	5039	320
1898	5658	356
1899	5230	418
1900	5260	410
1901	5554	509
1902	6092	428
1903	6062	520
1904	5573	379

2. Table II is a comparative statement of patients admitted for the last 3 years classified according to their nationalities.

TABLE II.

Nationalities	1902	1903	1904
Europeans ...	129	124	149
Creoles ...	4334	3587	3710
Asiatics ...	1629	2351	1714
	6092	6062	5573

3. Table III is a classification of the admissions according to their designations and the localities to which they belonged.

TABLE III.

Districts	Paupers	Private Patients	Police Force	Prison warders	Police Cases	Port Dept.	Non paying patients	Total	Deaths	Rate
Port Louis..	3663	572	495	59	91	28	176	5154	326	6.3 %
Pamplemousses.	162	3	16	...	...	...	...	181	39	21.5 „
Rivière du Rempart.	...	2	7	...	...	...	...	9	...	
Flacq ...	...	...	7	...	...	...	...	7	5	71.4 „
Moka ...	101	4	6	...	...	...	...	111	2	1.8 „
Plaines Wilhems.	4	...	55	12	...	...	...	71	3	4.2 „
Grand Port..	...	...	12	...	...	...	...	12	...	
Savanne ...	...	2	6	...	...	...	...	8	3	37.57 „
Black River.	...	...	20	...	...	...	...	20	1	5 „
Total ...	3930	583	624	71	91	28	176	5573	379	

Of the country districts, Pamplemousses supplied the largest number of patients, many of whom were admitted in such a low condition that 39 out of 181 died.

4. The total number of patients treated was 5715 and the daily average number in Hospital was 200 as against 199 in 1903 and 209 in 1902 (vide Table IV.)

TABLE IV.

Years	Daily average number in Hospital.		
	Males	Females	Total
1902	150	59	209
1903	139	60	199
1904	137	63	200

The highest number in Hospital on any one day was 256. This number was reached on the 16th. of May.

5. The following is a general statement of admissions, discharges and deaths in 1904.

TABLE V.

	Males	Females	Total		
Number remaining at end of 1903..	101	41	142		5715
Number admitted in 1904 ...	4251	1322	5573		
Total Number treated ...	4352	1363			5715
Cured ...	2579	840	3419	5210	5715
Relieved ...	1222	306	1528		
Not improved ...	185	78	263		
Number died ...	282	97		379	
Remaining at end of 1904 ...	84	42		126	

6. The rate of mortality was much lower than in 1903 and slightly less than in 1902, as can be seen from the following table.

TABLE VI.

Years	Number of patients treated	Number of Deaths	Death-rate per cent of patients
1902	6201	428	6.9
1903	6237	520	8.3
1904	5715	379	6.6

According to Table VII, 58 patients received *in articulo mortis*, died in less than 24 hours after admission. As a matter of fact, one-third of the deaths occurred in less than 72 hours after admission.

TABLE VII.

Died within 24 hours	Died between 24 and 48 hours	Died beween 48 and 72 hours	Total died within 72 hours
58	41	27	126

7. The diseases of most frequent occurrence were as usual Malaria, Tuberculosis, Dysentery, Bright's disease, Influenza, Anœmia, Debility, Syphilis and Rheumatism, with the addition this year of a new morbid element viz : Sloughing Tropical Phagedœna.

Table VIII shows the relative frequency and mortality of the most important diseases for the last three years.

TABLE VIII.

Diseases	Cases			Deaths			Case mortality per cent		
	1902	1903	1904	1902	1903	1904	1902	1903	1904
Malaria	1124	942	813	4	21	8	.35	2.2	.98
Tuberculosis ...	554	502	543	106	129	112	19	25.8	20.6
Influenza ...	261	402	332	4	9	6	1.5	2.3	1.8
Dysentery ...	220	244	154	36	44	40	16.3	21.5	26.5
Plague	28	72	47	15	20	20	53.9	27.7	42,5
Beriberi... ...	8	100	16	...	33	3	...	53	18.7
Syphilis	25	131	149	2	5	1	8	3,8	1.3
Anœmia... ...	155	243	170	6	3	2	4	1.2	1.17
Debility... ...	141	213	151	23	72	54	16.3	34	36
Tropical Phagedœna	...	...	373	...	...	1	...	...	.26
Bronchitis ...	482	366	301	9	4	3	1.8	1.1	1
Pneumonia ...	221	194	95	71	55	21	32.1	29.3	22.1
Bright's disease...	112	129	120	22	25	22	19.6	19.3	18.3
Rheumatism ...	295	265	190	3	1	...	1	.4	.53
Injuries	313	345	323	7	5	7	2.2	1.1	2.1

Malaria, Dysentery, Bronchitis, Pneumonia and Rheumatism prevailed to a much less extent than in the two preceding years. Cases of Syphilis, on the other hand, have been steadily increasing in number, while Tuberculosis is far from showing any signs of abatement.

Beriberi ceased to prevail in an epidemic form in 1904 and was in that respect superseded by Tropical Phagedœna. The case mortality of Malaria, Pneumonia, Tuberculosis and Influenza was much lower than last year. That of Dysentery was exceptionally high.

8. The following table gives the admissions and deaths during the 4 quarters of the year as compared with 1902 and 1903.

TABLE IX.

	Admissions			Deaths		
	1902	1903	1904	1902	1903	1904
First Quarter ...	1507	1845	1493	102	133	77
Second ,, ...	1497	1626	1547	87	111	88
Third ,, ...	1490	1340	1375	122	162	105
Fourth ,, ...	1598	1251	1158	117	114	109
	6092	6062	5573	428	520	379

This statement shows that the morbidity was highest in the 2nd. quarter and the mortality highest in the 4th.

9. The comparative prevalence of the most important diseases in different seasons of the year is shown in the following table which gives the monthly admissions in each case.

TABLE X.

	Malaria.	Hypertrophy of the spleen	Anœmia	Debility	Dysentery	Rheumatism	Tuberculosis	Influenza	Bronchitis	Pneumonia	Plague	Phagedœna
January	85	10	18	16	14	21	42	12	19	5	2	30
February	94	9	6	14	12	11	31	9	23	9	...	68
March	75	6	15	15	9	16	46	6	41	14	...	96
April	108	8	15	15	17	17	39	23	20	3	...	65
May	132	7	14	16	20	11	49	55	22	4	1	44
June	70	9	15	7	15	16	47	73	16	5	...	20
July	60	6	13	11	16	13	43	51	13	12	1	25
August	46	4	14	10	11	25	46	35	26	8	3	18
September	36	2	9	17	10	10	58	29	34	11	2	12
October	23	8	19	11	8	13	47	25	18	9	17	7
November	30	10	18	5	8	18	29	14	26	6	15	8
December	48	13	8	9	9	12	45	...	38	6	6	5
Total ...	807	92	164	146	149	183	522	332	296	92	47	393

The malarial months were February, March, April and May. Dysentery and Influenza were most frequent in April, May, June and July. The highest number of admissions for Bronchitis and Pneumonia was recorded in March. More than two-thirds of the cases of Plague were admitted in October and November.

10. Malaria.

TABLE XI.

Return of Malarial Fever.

	No. of Admissions			No. of Deaths		
	1902	1703	1904	1902	1903	1904
INTERMITTENT						
Quotidian ...	230	293	312	1	...	...
Tertian ...	8	10	24	...	...	...
Quartan ...	...	4	4	...	...	...
Irregular ...	7	15	7	...	...	...
Type undiagnosed..	845	559	407	...	...	...
REMITTENT ...	29	51	48	2	16	5
PERNICIOUS ...	1	10	5	1	5	3
	1120	942	807	4	21	8

The above return shows a steady decrease in the number of admissions for malarial fever, when compared with the two previous years. Half of the cases consisted in single attacks which yielded readily to the quinine treatment and had no recurrence. These could not be referred to any of the clinical varieties and were consequently returned under the heading " Type undiagnosed ". A more satisfactory return based upon the examination of the blood on admission is certainly desirable. Unfortunately, as explained last year, such an examination cannot be made in every case by the professional staff, through pressure of work. However, in 58 cases, the blood was examined with the following results :

Benign tertian parasites		...	24
Malignant ,,	,,	...	18
Double ,,	,,	...	8
Quartan	,,	...	6
Double quartan	,,	...	2
	Total	...	58

Three pernicious cases out of 5 terminated fatally from cerebral complications. Cases of the remittent type presented this year a milder character than last year. Only 10 per cent of these proved fatal, as against 31 per cent last year.

There were two characteristic cases of Hæmoglobinuric fever (Black Water Fever) which ended in recovery. Both patients were of mixed European and Asiatic or African blood. I have already called attention to what appears to me to be a racial immunity from this disease possessed by the inhabitants of this Island of purely Asiatic or African origin. As a matter of fact, Black Water Fever is of extremely exceptional occurrence in the practice of our hospitals where the great majority of the patients have no trace of European blood. This fact, when examined in connection with the Malarial theory of Hœmoglobinuric Fever, is worthy of note ; for it is well-known that in this Island Asiatics and Africans, whether or not born in the Colony, are as easy preys to Malaria as the inhabitants of mixed or pure European blood. In the above mentioned cases, the blood examined at different periods did not reveal the presence of Malarial parasites.

11. *Hypertrophy of the Spleen and Anœmia.*— Ninety two cases of hypertrophy of the spleen came under treatment, with two deaths.

Anœmia, chiefly the consequence of Malaria and privation, accounts for 164 cases and two deaths.

In presence of the recent discoveries concerning the relation of Splenomegaly coupled with Anœmia and ulcers to Kala-Azar and the association of this cachectic condition with Leishman Donovan's bodies, I attempted to have investigations carried on in that line. In a few cases, blood from the spleen was examined before and after death with no result. Unfortunately want of time and objections on the part of patients to submit to the puncturing of their spleens did not allow of the observations being made otherwise than on a very limited scale.

The following case affords a striking illustration of the dangerous complications to which an enlarged spleen may give rise.

Case of Hypertrophy of the Spleen—Displacement of the organ—Torsion of the Pedicle—Intestinal obstruction—Death.

Juliana R., a girl of about 20 years of age, was admitted to hospital on the 18th of February in a very critical state with fever, a weak and rapid pulse, intense anœmia and a large floating spleen. She complained of pains in the abdomen and lay constantly in the dorsal decubitus with the legs bent up. She was too ill to be able to give any information about her case. The abdominal symptoms gradually increased in severity, and, on the morning of the 22nd, the patient after an exceedingly bad night was in a very distressing condition. The abdomen was distended, tense and tympanitic. The breathing was laboured and hurried, the pulse very rapid and almost imperceptible, and the expression of the face showed great anxiety. Patient had had a slight evacuation on the 19th, but since then the bowels had not been moved, even under repeated administrations of enemata. The symptoms pointing to intestinal obstruction, I had 500 c. c. of saline solution injected subcutaneously and resolved to resort to Laparotomy as the only means left of saving the patient's life. But while everything was being made ready for the operation she sank so rapidly that all idea of surgical interference had to be given up and she died in the course of the day.

A *post mortem* examination was made which revealed the following conditions : On opening the abdominal cavity, the intestines were found considerably distended with gas so as to conceal all other organs from view. On the intestinal mass being pushed to the right, the spleen was exposed. It was enormously enlarged and occupied the whole of the left side of the abdominal cavity.

It was displaced in such a way that it presented its internal or concave surface directly forwards and its convex surface backwards. There was marked torsion of the pedicle so that the splenic vessels were considerably dilated and were changed into a fusiform mass about 1 inch wide. At the hilum, the twisted vessels looked like a thick cord of the size of a little finger. The pedicle appeared to have been twisted from right to left through an angle of more than 90 degrees. The organ had moreover descended so that its lower extremity, which was very thick, rested on the lower part of the descending colon and completely obliterated its lumen.

The spleen measured 12 inches in length, 7 inches in width and 5 inches in thickness. It weighed 3 kilos 150 grams.

The peritoneum, both visceral and parietal, was intensely congested and there was marked localised peritonitis at the point of contact of the spleen with the descending colon.

12.— *Dysentery.*— There was in 1904 a considerable falling off in the admissions for Dysentery. Most of the cases were as usual received in an advanced state of the disease and very frequently in a hopeless condition. This was especially so with the chronic cases which gave the high mortality of 47.5 per cent. The acute cases however proved readily amenable to the saline treatment, there being only one death for a total of 67 patients.

TABLE XII.

	Cases.			Deaths.		
	1902	1903	1904	1902	1903	1904
Acute Dysentery ...	142	138	67	2	5	1
Chronic Dysentery.	78	106	82	34	39	39
	220	244	149	36	44	40

13. *Enteric Fever.*—There were 5 admissions for Enteric Fever with three deaths. Two of the patients, one of whom a European seaman, were received *in extremis* and died in from 24 to 48 hours after admission.

Another patient, whose health had already been greatly undermined by Malaria, died in the 3rd week of the disease from asthenia. The diagnosis was confirmed in every case save one by Widal's sero-reaction.

14. *Plague.*—Forty seven cases of Plague came under our notice in 1904 as against 71 in 1903 and 28 in 1902.

The monthly admissions were as follows :

January	2
February	..
March	. .
April	...
May	1
June	...
July	1
August	3
September	2
October	17
November	15
December	6
Total ...	47

LONDON SCHOOL OF TROPICAL MEDICINE
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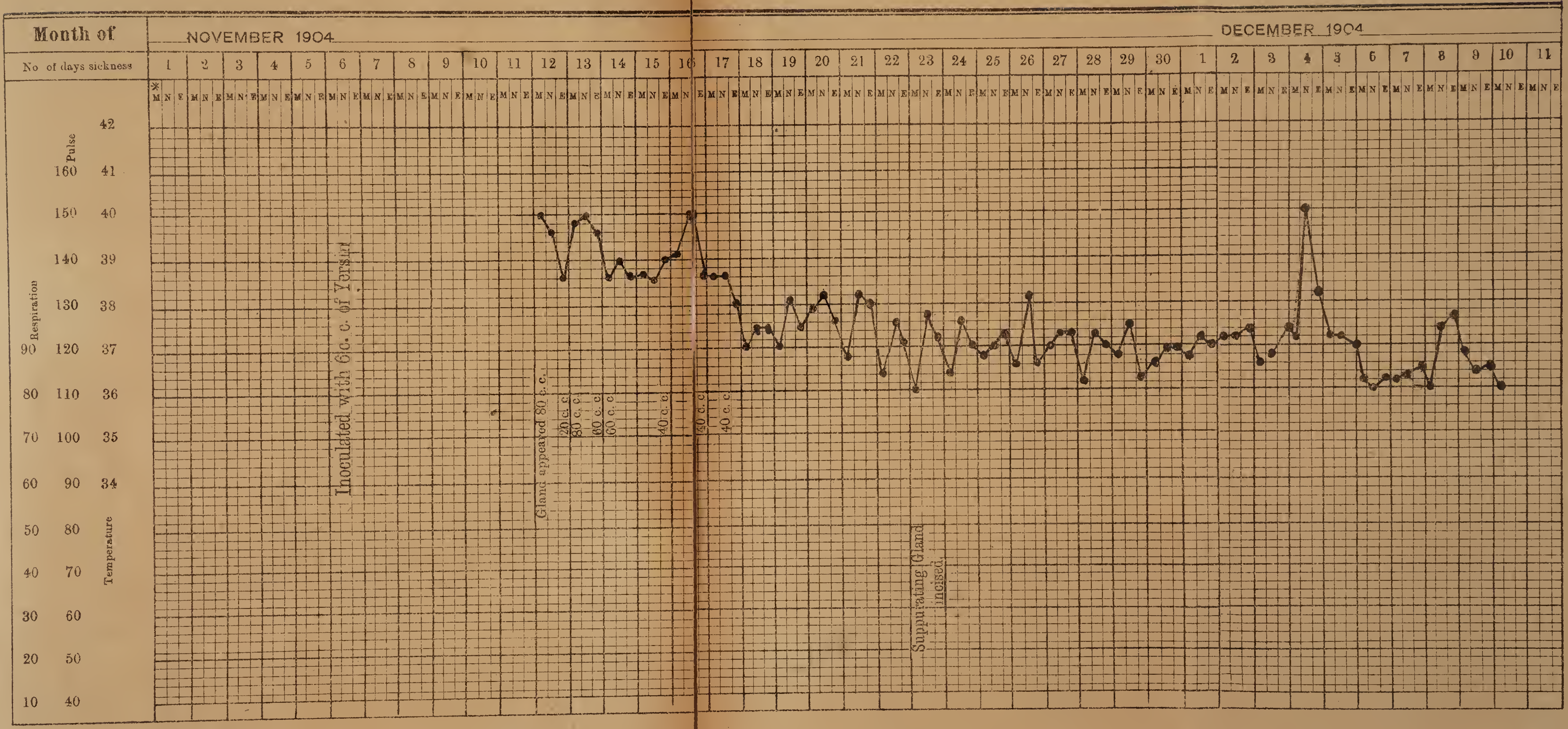
Civil Hospital—Name L. BIENVENUE, Age 2 1/2, Sex MALE.

SEGREG: CAMP Diagnostic PLAGUE



* M —Morning
N —Noon
E—Evening

The first half of the year was practically free from Plague. The disease prevailed in the second half, the maximum intensity being reached in October and November.

Twenty of the patients, too low to be removed with safety to Bois Savon Lazaret, died in this hospital. One case, however, admitted in that condition, deserves special mention, as having recovered under massive injections of Yersin's serum.

The patient, a little boy 2 1/2 years old, was admitted on the 12th of November. He lived in a yard where a case of plague had been detected on the 5th of November. He had for this reason received a preventive inoculation of 6 c. c. of Yersin's serum on the 6th. On the 9th he began to have fever and for the three following days was treated for Malaria, in the absence of positive plague symptoms. Quinine, both by mouth and hypodermically, was administered. Calomel was given on the night of the 10th and a dose of Castor oil on the morning of the 11th. As his condition grew worse, he was sent on the 12th to hospital, where, on admission, he had a temperature of 40 ° C and a pulse of 150.— No enlarged glands could be made out anywhere but the little patient kept his head persistently drawn to one side and, upon careful exploration, a tender spot was detected on the side of the neck to which the head was drawn. Plague was diagnosed but, as the patient was too weak to be removed with safety to Bois Savon, he was at once isolated and 80 c. c. of Yersin's serum were injected subcutaneously. In the evening he received 20 more c. c. On the following day, a cervical bubo was quite distinct and plague symptoms had definitely set in. From the 12th to the 17th, the patient lay in a critical condition and very little hope was entertained as to his recovery. The serum injection was however persistently repeated every day in massive doses the quantity used in the course of these 6 days being as follows :

12th.	November	morning	...	80 c.c.
„	„	evening	...	20 „
„	„	morning	...	80 „
13th.	„	evening	...	60 „
14th.	„	morning	..	60 „
15th.	„	evening	...	40 „
16th.	„	evening	...	40 „
17th.	„	evening	...	40 „
		Total	...	420 c.c.

This quantity is no doubt enormous for a child of 2½ years but the case was so severe that it fully warranted this heroic treatment, to which I have no hesitation in attributing the successful result obtained. On the morning of the 18th the temperature fell to normal and from that date the patient rapidly improved. The Bubo suppurated and was incised on the 28th. His convalescence was uneventful, save for an attack of Malarial fever on the 4th of December. He was discharged from Hospital on the 10th of December quite cured. Coupled with the injections of Yersin's serum, carbolic acid was from the very beginning administered in 3 drop doses every 2 hours, but carboluria appeared after 24 hours and this treatment had to be discontinued. The patient was also given digitalis and stimulants.

This case is interesting not only for the very large quantity of serum used when compared with the age of the patient, but also for the unusually late appearance of the bubo, viz. on the 4th day of the disease. Whether the preventive inoculation of Yersin's serum, which was made in the incubation stage of the disease, had anything to do with the protracted development of the bubo, it is difficult to say.

15. *Beriberi*—The epidemic of Beriberi referred to in last year's report, died out towards the end of 1903 and, with but few exceptions, restricted itself to its importers. A few cases, viz. 16, were admitted in the course of the year but these were for the most part as it were the last vestiges of the epidemic of the preceding year.

16. *Yaws.*—Four cases returned as "Yaws" belonged to the variety known as *crab-yaws* where the soles of the feet are affected. This form is well known in the Island. It is characterised by a very painful thickening and hardening of the sole of the foot which is designated by the natives as *crape-roche* (compare with the terms *crabes* and *crap pox* used in the West Indies for the same affection). This hardened epidermis is frequently fissured, in which case the cracks may exude a slight discharge.

I have not yet come across a single case of the general papular eruption which has given to *Framboesia* its name.

17. The diseases returned under *Tuberculosis* were the following.

TABLE XIII.

	Cases	Deaths
Pulmonary tuberculosis ...	489	94
Tuberculosis of glands ...	10	5
Tubercular Enteritis ..	17	9
Tuberculosis of bone ...	3	2
Tubercular Arthritis ...	1	1
Tubercular Cystitis ...	1	..
Tubercular Peritonitis ...	1	1
	522	112

It is very disappointing to have to report that although there was a great reduction in the admissions for all diseases, the admissions for Tuberculosis exceeded last year's by 20 and that this disease accounted by itself for a little less than one third of the deaths, while in 1903 it came in for one fourth of the hospital mortality. The remarks I made on this subject in my last report therefore hold good with still greater force this year.

18. *Syphilis.*—The following comparative statement of the admissions for Syphilis for the last 4 years shows that this disease has been steadily increasing in the returns of this hospital so as to give 57 more admissions than 4 years ago.

1902	85 cases
1903	110 „
1904	128 „
1905	142 „

The total number treated was 149, classified as follows :

TABLE XIV.

	Cases.	Deaths.
Inherited ...	3	...
Primary ...	47	...
Secondary ...	56	...
Tertiary ...	43	1
	149	1

19.—*Tropical Sloughing Phagedœna* :

(1.) This year has been characterized by the appearance for the first time in the nosology of the Civil Hospital of Tropical Sloughing Phagedœna.

The disease, which first broke out in the Country districts, spread to Town at the end of 1903 and during the earlier months of 1904, cases actually poured into this Hospital. Ulcers have always been noticed on the lower extremities of patients suffering from enlarged spleen and anœmia, but these were, to all appearances, atonic sores with no tendency to sloughing. At any rate, I am not aware that an epidemic affection presenting the typical characters of Tropical Sloughing Phagedœna has ever prevailed in Town to the extent recorded in 1904.

(2.) No fewer than 398 cases came under our notice in the course of the year, the monthly admissions being as follows :

January	30
February	69
March	96
April	65
May	44
June	20
July	26
August	18
September	12
October	7
November	8
December	5

March gave by far the greatest number of admissions, February and April came next. From May the epidemic gradually decreased and in December only 5 cases were admitted.

(3.) Patients suffering from the disease were all Creoles and Indians walking bare-footed. We had no case among Chinese. Men were more frequently affected than women and children rarely so.

(4.) The lower extremities were as a rule involved, the favourite seats being the dorsum of the foot, the regions of the malleoli and the anterior and lateral aspects of the legs. In 100 consecutive cases, the seats of the ulcers were as follows :

Antero-lateral aspect of legs ...	40
Dorsum of foot ...	34
Malleolar regions ...	20
Ankles ...	3
Heels ...	3
	100

In two cases, the characteristic lesions were detected in unexpected regions, viz : the scalp and the interior of the vagina in the vicinity of the cervix.

(5.) In the majority of the cases, the disease was associated with other conditions. A small proportion however showed no appreciable signs of constitutional diseases and but slight impairment of the general health. In the 100 cases mentioned above the followed conditions existed :—

Hypertrophy of the spleen and anœmia	in	51	cases.
Anœmia with or without debility	„	18	„
Bright's disease	„	3	„
Bronchitis	„	3	„
Malaria	„	2	„
Syphilis	„	2	„
Gonorrhœa	„	1	„
Influenza	„	1	„
Eczema	„	1	„
Diarrhœa	„	1	„
No appreciable disease	„	17	„
		100	cases.

In many other cases, Scabies was present.—

(6.) The ulcers occurred either single or in groups of 2, 3 or more, affecting usually one leg, not unfrequently both. According to the patients' accounts, the disease started either as a small sore following slight injuries such as scratches and abrasions, or as a sort of boil which came on without any history of traumatism. In the latter case a bleb was formed which, on bursting, left an ulcerative surface. In whatever way the ulcers began, they rapidly extended in all directions and became covered with a layer of thick, dirty looking and fetid pus in which shreds of sloughs were imbedded.

The sloughing process varied in degree. In the milder cases which constituted the majority, the skin and subcutaneous tissue only had undergone gradual sloughing over more or less extensive surfaces, the deep tissues being left unaffected. The ulcers thus formed were excavated and were characterised by raised, rounded or irregular, undermined edges. Their surfaces freely discharged pus of the nature described above. The skin was frequently undermined to a considerable extent above and below the sore. Photographs 1 to 4 are very good illustrations of cases of this description.

In other cases, tendons and muscles were exposed and subsequently underwent partial or total sloughing (Vide Photographs 5 and 6).

In the severest form, in addition to the destruction of soft tissues, there was necrosis of underlying bone. In a few instances, the whole foot and leg were in a gangrenous condition. Extreme cases like these were fortunately of very exceptional occurrence.

The Tendo Achillis and part of the Calcaneum had to be excised in one case and the greater part of the Tibialis Anticus in two cases. Necrosed pieces were also removed from the body of the Tibia, from the Malleoli and from the bones of the Tarsus. One case in this respect was interesting : The patient, an Indian 18 years old, was admitted on the 20th of May with a large sloughing ulcer extending over the front of the lower third of the left leg. Patient suffered at the time from malarial fever attended by anœmia and hypertrophy of the spleen. There was an abundant discharge of pus not only from the sore itself but also from a large cavity, as ascertained by probing, which led on to its undermined edge from above. On the following day, a free vertical incision was made into this cavity which lay over the external part of the tibia, when all the muscles attached to the bone were found in a sloughing condition and the bone itself completely denuded of its periosteum along a considerable part of its length. All gangrenous tissues were removed with scissors and by scraping and carbolic fomentations were applied for some days. On the 28th, the leg presented on the anterior aspect of its lower two thirds a granulating surface which covered the fibula and extended underneath the tibia through the interrosseous space to the inner part of the leg, leaving the lower two thirds of the necrosed bone, with the exception of the lower extremity, completely exposed. His general condition had much improved. Excision of the exposed tibia was considered advisable but the patient refused to submit to the operation and applied for his discharge. He came back to hospital on the 18th of October. The granulating tissue had now completely cicatrised and the necrosed tibia, from the tuberosity to a little above the malleolus, was still lying bare over this cicatrised surface, but was getting loose at its upper part. The patient this time consented to the excision and a piece of tibial shaft about 8 inches long was removed. He was discharged from hospital with a crutch on the 2nd of December, completely cured. The accompanying photograph, No 9, was taken by a student on the patient's second admission to hospital. In two cases, the destruction of the tissues of the leg and foot was so extensive that amputation above the knee had to be resorted to. Both patients whose state of health was far from satisfactory, rapidly recovered after the operation. Photographs Nos. 7 and 8 show the leg of one of these patients. In a third case of the same nature, the patient who was admitted with high fever and delirium was too weak to allow of an amputation being made with any chance of success. He died soon after admission. That was the only fatal case we had.

(7.) *Treatment.*— Various antiseptics were tried one after the other at the outset viz: Corrosive-Sublimate, Formol, Permanganate of Potash, Lysol &c., but the results obtained were not satisfactory. The treatment that proved most successful was the application of pure carbolic acid with a lint or cotton mop as recommended by Manson, frequently repeated until sound granulations were obtained. After each carbolic cauterisation, the ulcers were dressed with powdered Camphor. Under this treatment superficial sloughing sores, even extensive, and of the worst appearance, were soon converted into healthy granulating ulcers which healed rapidly. Many patients however, who left hospital too soon, had to come back shortly after, the sloughing process having recurred in their sores.

When the deeper tissues were involved, the gangrenous muscles and necrosed bones were removed under chloroform and the resulting surface freely scraped. Then, carbolic fomentations were applied until this surface was perfecty cleaned and covered with healthy looking granulations. Finally, camphor dressing was used. I need hardly say that due attention was at the same time paid to the constitutional condition of the patient. Tonics were freely administered chiefly in the shape of Easton's Syrup.

The application of carbolic acid with a cotton or lint mop gives rise to a slight burning sensation which is quickly followed by relief.

(8). *Etiology.*—In presence of the abundant opportunities afforded us, we were led to make bacteriological investigations with a view to elucidating the etiology hitherto unsettled of this affection. The researches which were carried on chiefly by Mr. Maya gave the following results:

The examination of the purulent discharge and sloughs revealed the presence of pyogenic organism and saprophytes. After the ulcer had been rid of all discharges and thoroughly cleansed by prolonged washing with sterilized water, the sides of the sores were gently pressed and slide preparations were made with the saneous exudation which then appeared on its surface. In every case thus examined, a micro-organism was found which presented the following characters. It was a straight or slightly curved bacillus with rounded or somewhat tapering extremities. Its length was 3 or 4 times its width, it was very motile and was easily stained but not uniformly so with basic aniline dyes, clear spaces (two or more) being left unstained. It was decolorized by Gram's method. It resembled Vincent's bacillus of Hospital Gangrene but differed from it by its motility. In this latter respect as well as morphologically speaking, this bacillus answered exactly the description of the bacillus found by Crendiropoulo in similar cases.

Attempts at staining the cilia after Von Ermengem's method failed. This bacillus was found in considerable number in the preparations either alone or associated with a very fine spirillum which stained very lightly and was decolorized by Gram's method.

The bacillus was successfully cultivated in the ordinary media viz :—Peptone Broth, Agar-Agar, and Gelatine, and the results obtained were similar to those described by Crendiropoulo in his interesting paper on the Etiology of " *Ulcère de Yémen*", published in the October 1897 number of the " Annales de l'Institut Pasteur."

The constancy of the presence of this bacillus in very large number and frequently alone in the exudations from the Phagœdenic sores tends to indicate that it is really the micro-organism concerned in the Etiology of the Sloughing Phagedœna that has been prevailing in this Island since the end of 1903.—Morphologically and biologically, it resembles very much the bacillus described by Crendiropoulo in " Ulcères de Yemen ".—Two facts, however, which came under our notice in the course of our investigations, are not mentioned by Crendiropoulo, viz : The occasional association of the Bacillus with a Spirillum and the presence of clear spaces in the stained preparations.

These characters are possessed by Vincent's Bacillus of Hospital Gangrene but the latter materially differs from the very motile Bacillus under consideration in that it is not capable of spontaneous movement.

It is also interesting to note that the lower extremities were almost invariably affected and that only persons walking barefooted presented the lesions. The natural conclusion is that the soil is the usual habitat of the pathogenic organism concerned.

20. *Respiratory diseases.*— There was a marked reduction in the number of admissions for Bronchitis and Pneumonia. The latter numbered 50 per cent less than last year and gave a much lower death-rate.

21. *Diseases of Urinary System.*—The prevalence of Bright's disease to which attention was called in previous reports, has not abated. There were in 1904, one hundred and twenty cases as against 129 in the preceding year.

22. *Injuries.*

Injuries.	Cases.	Deaths.	Remarks.
General :—			
Burns	1	1	
Local :—			
Burns & Scalds	17		
Bruise	88		
Wound	140		
Sprain	7		
Dislocation of			
Shoulder	4		
Elbow	1		
Wrist	1		
Thumb	1		
Fracture of :—			
Femur	6	1	
Tibia	5		
Clavicle	1		
Humerus	8		
Radius (Colles')	7		
Ulna	1		
Radius and Ulna	3		
Phalanx	1		
Ribs	3		
Lower jaw	1		
Gunshot wound	9	1	Case of homicidal gunshot wound of the lung.
Concussion of brain	2		
Concussion of spinal cord	2		
Rupture of intestine	2	2	Cart accidents. Lesions verified on P.M. exam.
Penetrating wound of lung	1	1	Fracture of Clavicle and perforation of apex of lung by fragment.
Rupture of ligamentum Patellœ.	1		
Internal Hæmorrhage	1	1	Cart accident — Patient died shortly after admission. The nature of the injury could not be ascertained as no P.M. was allowed.
Foreign body in larynx	1		
Foreign body in hand	1		
	316	7	

Case of Compound Fracture of Radius and Ulna—Malignant Œdema — Amputation — Tetanus — Recovery.

R. A.—boy, 14 years old, admitted to the Civil Hospital as an urgent case on the 1st of March, with a compound fracture of the left radius and ulna, at the junction of the lower with the middle third. The lower fragment of the ulna was projecting through the wound to the extent of about 1½ inch. The skin wound was evidently caused by the above mentioned fragment piercing through the soft tissues. The injury was the result of a fall from a tree sustained two hours or so before admission. —On the previous night it had been raining abundantly so that the ground was soft and muddy ; the wound and fragment of bone were consequently soiled with mud. —The Assistant Medical Superintendent who received the patient, thoroughly cleansed the wound of all the dirt it contained and sawed off the projecting piece of bone. The fractured arm was then dressed antiseptically and placed in an apparatus.— On the following day the wound presented nothing abnormal. The temperature was 38 ° C. in the morning and 39 ° C. in the evening.—On the 3rd. 8 c. c. of antitetanic serum were injected as a prophylactic measure rendered advisable by the circumstances under which the accident occurred and the state in which the injury was on admission. On the dressing being removed in the afternoon, a dirty looking and offensive discharge escaped from the wound together with gas bubbles. There was considerable œdema of the hand and of the arm below the wound. The temperature was then 39 ° . The patient was at once anœsthetised and free incisions were made above and below the seat of fracture, and the interior of the wound completely laid bare, thoroughly irrigated with oxycyanide of mercury solution (1 in 1000), then swabbed with camphorated spirit (1 in 5). Finally the whole limb was wrapped in sublimate wool and placed in a splint. In the evening the temperature fell to 37 ° . Smear preparations made with the discharge from the wound showed the presence of the Bacillus Septicus associated with streptococci. *On the 4th.*, the discharge was less but the œdema persisted. The wound was irrigated with Hydrogen Peroxide and the Temperature which was 38.2 ° before the dressing, fell to normal in the evening. *On the 5th.* the patient was much worse. The œdema had increased in the hand and had spread above the wound which discharged a small quantity of extremely fetid pus. There was fever and the pulse was very quick. Amputation above the elbow, the only course now left, was performed in the afternoon.

March 6th. Temperature normal, but patient very restless.

March 7th. Peculiar twitchings were noticed on the face attended by some difficulty in swallowing and slight stiffness of the neck.

March 8th. Trismus and risus sardonicus present. In the afternoon spasms affected muscles of the face, neck and right arm. They lasted only a few seconds and were not very frequent. Deglutition was fairly good and patient could take liquid food well. Bromide of Potassium and Chloral administered in massive doses. Stump in a perfectly satisfactory condition.

March 9th, Patient worse, spasms more violent, more distressing, and more frequent. Trismus complete. No opisthotonos. Lower extremities not involved. Temperature normal. There was profuse perspiration.

March 10th. Slight improvement. Fits not so frequent. Patient could sleep a little now and then.

March 11th. Back and lower extremities involved. There was some opisthotonos but not very severe.

March 12th. Fits strong but of short duration and not frequent, stitches removed from stump which had healed by first intention.

March 13th. Opisthotonos no longer present, spasms restricted to upper extremities neck and face and more marked on the left than on the right side. Tetanic symptoms aggravated by Bronchitis. Temperature above normal.

March 14th. Spasms less severe, but Fever persisting and expectoration difficult.

From the 15th the patient gradually improved. The tetanic symptoms became less and less severe and Bronchitis and Fever subsided.

From the 22nd he was considered to be convalescent. He was discharged from Hospital *on the 30th,* cured. He could walk very well and appeared in good health, the only thing left being some stiffness of the muscles of the back and neck, giving to the patient a hunch-backed appearance. I may add that for about sixteen days the patient was so fully kept under the influence of chloral that a rash appeared. The interesting points in this eventful case of one month's duration are the following :—

1o. The conversion of a simple into a compound fracture by fragment of bone.

2o. The double infection of this open wound by the Bacillus Septicus and the Tetanus Bacillus, the two microorganisms which are found in the soil and which in this case were present side by side.

3o. The consequent appearance of Malignant Œdema 2 days after the accident and of Tetanus 7 days after.

4o. The comparatively mild character of the Tetanic manifestations and their short duration—attributable probably to the antitetanic preventive inoculation made in the incubation stage of the disease.

5o. The complete recovery of the patient in so short a time after such a train of serious complications.

23. *Obstetrical Returns.*

There were 58 confinements as against 36 last year. They have been classified as follows :

1. Premature delivery	13	
2. Full-Term delivery		
a. Natural Labour		
i. L. O. A. presentation	38	
ii. Breech „	2	
b. Dystocia.		
i. From contracted pelvis	3	Forceps application
ii. From Uterine Inertia	1	Forceps application
iii. Arm presentation (dead Fœtus)	1	Embryotomy

The Return of Births is as follows :

	Number.	Deaths.
Born alive (Full Term)	40	...
Prematurely Born	14	6
Still Born	5	5
	59	11

Forty eight children lived and 11 were either still born or died shortly after birth. In several instances the women were admitted in actual labour and with their fœtuses already dead. Two of the children prematurely born were twins, in the case of one of which there was a breech presentation.

24. *Surgical Operations.*

513 Operations were performed during the year of which
162 under chloroform
55 with cocaine
34 with chloride of Ethyl
262 without anœsthetic.

No accident occurred during or after administration of Chloroform.

The following is a complete return of the operations performed :—

Return of Surgical Operations.

	Cases.	Deaths.	Remarks.
1, Removal of Tumours.			
(a) Non-Malignant :			
Papilloma	4		
Fibroma	1		
Ranula	1		
(b) Malignant :			
Carcinoma of Breast	3	1*	*Recurrent Scirrhus of Mamma on a woman 65 years old.
Epithelioma of Breast	1		
Adeno Sarcoma of Breast	1		
Carcinoma of Cervical glands	1		
Epithelioma of skin	2		
2. Amputations.			
Arm	1		
Fingers	4		
Thigh	5	2	
Leg	3		
Toes	9		
3. Operations on Bones.			
(a) Excision of fragments of bones for Caries or Necrosis.			
Femur	4		
Tibia	8		
Calcaneum	2		
Ribs	4		
Humerus	1		
Phalanx	1		
Sternum	2		
Upper-jaw	1		
Sacrum & Iliac bones	4	1	Died of Tuberculosis.
(b) Reduction of Fracture (under chloroform).			
Femur (compound)	1		
Humerus	1		
Radius & ulna (compound)	2		
Lower-jaw (compound)	1		
4. Operations on Joints.			
Arthrotomy	4		
Reduction of dislocation of			
(a) Shoulder	2		
(b) Elbow	1		
(c) Thumb	1		
(d) Lower jaw	1	1	Died of Chronic dysentery.
Carried over	77	5	

	Cases.	Deaths.	Remarks.
Brought forward	77	5	
5. OPERATIONS ON MUSCLES & TENDONS			
Excision of Tendo Achillis (gangrenous)	1		
Excision of gangrenous muscles of leg	4		
Incision for Suppurative Tendinitis	2		
Aspiration for Bursitis	1		
6. OPERATIONS ON THE EYE.			
Cataract	20		
Iridectomy	1		
Critchett's operation for Staphyloma	1		
7. OPERATIONS ON THE EAR.			
Trephining of Mastoid cells	1		
8. OPERATIONS ON THE HEAD & FACE.			
Removal of nasal Polypi	2		
9. OPERATIONS ON THE CHEST.			
Paracentesis of Pleural cavity.	1		
10. OPERATIONS ON ABDOMINAL CAVITY.			
Paracentesis for ascites	31		
Exploratory Laparotomy	2		
Radical cure of Hernia	1		
Herniotomy for strangulation	1		
Abscess of Liver	11	6	
11. OPERATIONS ON RECTUM & ANUS.			
Fistula in Ano	5		
Dilatation of Anus	1		
12. OPERATIONS ON URINARY ORGANS			
Dilatation and catheterisation for urethral stricture	13		
Urethrotomy			
(a) External	4	1	Died of chronic purulent cystitis.
(b) Internal	1		
Urinary Fistulæ	4		
Tapping of Bladder	1		
Scarifications for Extravasation of Urine.	5		
Lithotomy (lateral perineal)	1		
13. OPERATIONS ON MALE GENERATIVE ORGANS.			
Circumcision	25		
Reduction of Paraphymosis	1		
Radical cure of Hydrocele	1		
Tapping for Hydrocele			
(a) with Injection	1		
(b) without Injection.	25		
14. OPERATIONS ON FEMALE GENERATIVE ORGANS.			
Ovariotomy	1		
15. OPERATIONS ON ARTERIES.			
Ligature of Posterior Cervical	1		
Ligature of Radial ...	1		
16. OPERATIONS ON LYMPHATIC GLANDS.			
Excision of :—			
Axillary glands (tubercular)	2		
Femoro-inguinal (venereal)	1		
17. OPERATIONS ON SKIN AND SUBCUTANEOUS TISSUE.			
Scraping of Indolent ulcers	1		
Scraping and cauterising of Phagedenic ulcers.	6		
Incision of Whitlow	2		
Incision of Carbuncle	2		
Incisions for Gangrene of foot	1		
Excision of Phagedenic ulcers	2		
Carried over	265	12	

	Cases.	Deaths.	Remarks.
Brought forward	265	12	
18. Evacuation of Abscesses.			
Head and Face	9		
Neck	3		
Chest	3		
Abdominal wall	2		
Back	2		
Lumbar	2		
Upper extremities	22		
Lower extremities	62	1	Died of Tuberculosis.
Generative organs	25		
Iliac	2		
Psoas	1		
Perineal	14		
Periosteal	4		
Glandular	27		
Other regions	22		
Diffuse cellutitis	17	1	Died of Senile Debility.
Incision & scraping of Sinuses.	9	1	Died of Tuberculosis.
19. Removal of Foreign bodies.	2		
20. Suturing of Wounds.	3		
21. Extraction of Teeth	12		
22. Obstetric operations.	5		
Total	513	15	

(a) There were two deaths after amputation of the thigh. One of the patients who had been amputated for Tubercular Arthritis died of asthenia three weeks after the operation. In the other case, amputation had been performed for compound fracture of both bones of the leg caused by the wheel of a cart. Patient at first objected to the amputation and only consented to it when septicœmia had set in. The operation proved of no avail and he died two days after.

(b) *Abscess of the Liver.* We had 11 (eleven) cases of Abscess of the Liver, as against 8 last year. Five were admitted in a very bad condition, suffering from chronic dysentery in addition to the liver abscess. They were only temporarily relieved by the operation. In the remaining fatal case, the patient, an Indian seaman, was suffering from advanced Beriberi as well.

In the 5 successful cases, save one, there was a previous history of dysentery.

(c) *Exploratory Laparotomy* was resorted to in two cases.

Case I.—Indian Constable of Police with a suicidal gunshot wound of the stomach.—The anterior surface of the viscus was exposed and an attempt was made to suture the wound ; but this could not be done because respiration and circulation showed signs of failure each time the stomach wall was pulled through the abdominal wound. After a large quantity of blood had escaped from the abdominal cavity, the abdominal incision was sutured. The patient was kept on iced milk for some days and he eventually recovered.

Case II.—Creole of unsound mind who had swallowed his sacred beads including a brass cross more than 1 inch long.—Fear was entertained that this mass might be stopped in some part of the alimentary tract and it was decided to extract it from the stomach. Laparotomy was performed a few hours after the event. The stomach was carefully explored from outside but the beads and cross were no longer in it. It was not considered advisable to carry on the exploration further and the abdominal wall was closed on the expectation that having passed the pylorus, the foreign body would probably find its way downward without much difficulty. Forty eight hours after the operation, the beads cross and all were evacuated per Rectum and a fortnight after, the patient was perfectly well.

(d) The most interesting operation of the year was an *ovariotomy* performed by Dr. E. Pépin assisted by Dr. de Chazal and myself, with Dr. Sinnatambou as anœsthetist.

Augusta X, 30 years old, married, never had children, had suffered constantly from malaria and on admission was found in a marked cachectic condition, presenting a large ovarian cyst occupying the whole of the right side of the abdomen and extending a little to the left of the umbilicus. This tumour gave rise to pressure symptoms viz : Dysuria, Tenesmus and Constipation. Patient was emaciated and anœmic and had an enlarged spleen. She was not in fact in a condition favourable for operation. However she suffered from such distressing symptoms that with her consent the operation was decided upon and performed on the 23rd of July. The cyst was a very large one. The fluid evacuated measured about 3 litres. The sac had contracted adhesions with the bladder and intestines, so that its removal was a long and tedious proccss. The Patient remained 1 hour and a quarter under chloroform. The lower part of the wound was drained with sterilized gauze. Patient had little or no fever from the date of the operation up to the 1st of August, but, for the first four days, the pulse was extremely rapid and ran between 130 and 140 per minute. From the 1st of August, although the healing of the abdominal wound progressed favourably and the general condition was on the whole satisfactory, the temperature rose and kept fluctuating between 37.4 and 39.6 until her discharge. There were marked daily remissions and occasional intermissions at different hours of the day but more frequently in the evening. The spleen went on steadily increasing in size and got gradually displaced so as to assume more and more a horizontal position in the abdominal cavity. The patient was kept under the influence of Quinine and Arsenic without any beneficial result. On the 29th of August, the abdominal wound having completely cicatrised, the patient was discharged at her request with a view to trying a change of air at Quatre Bornes. On the day of her discharge the temperature was 38 °, the spleen which was of an enormous size, occupied almost a horizontal position, extending from the left hypocondriac across the umbilical to the right lumbar regions. I had occasion to see her two months later. Her health had then much improved and she appeared in a fairly good condition.

The remarkable feature in this case is the setting in shortly after the operation of an irregular and persistent type of fever, attended by progressive enlargement and gradual displacement of the spleen : Quinine administered in almost every form, had absolutely no effect on the march of this fever which persisted through one month and had not left the patient when she applied for her discharge. In fact this condition, unrelieved as it was by quinine, resembled very much Kala-Azar and the Cachexial Fever associated with Leishman Donovan's body. (B.M.J. Sept. 17/1904). Unfortunately the examination of the blood from the spleen could not be made.

Laboratory work.

25.—The following summary of the work done in the small laboratory attached to the Civil Hospital shows at a glance the extent of the services which an institution of this kind can render not only to our hospitals but also to the population in general. A number of these examinations, (chiefly for Widal's sero-reaction) were made at the request of private Practitioners. The Laboratory is managed entirely by Mr Maya who deserves the highest commendation for the care and attention which he bestows on such pursuits :—

A.—BACTERIOLOGICAL.

	Specimens examined.	Nature of researches.	No.
1	Sputum	Tubercle Bacillus	116
	Pus	„	2
	Urine	„	3
	Pleuritic fluid	„	1
2	False membranes and swabbings from throat	Diphtheria Bacillus	2
3	„ „ „	Vincents' „	2
4	Urethral discharge	Gonococcus „	22
	Urinary sediment	„	7
5	Sputum	Plague Bacillus	9
	Blood	„	10
	Smear preparations from buboes	„	8
	„ „ „ spleen	„	3
	„ „ „ lungs (after death)	„	2
6	Fluid from Ovarian Cyst	Pathological cells	3
7	Pus	Pyogenic Organisms	7
8	Sputum	Pneumococcus	2
9	Blood from suspected typhoid cases	Widal's sero-reaction	53
10	Blood from suspected case of Malta Fever	Agglutination test	1
11	Blood for	Malarial Parasites	
		(a) Benign Tertian	24
		(b) Double „	8
		(c) Quartan	6
		(d) Double Quartan	2
		(e) Malignant tertian	18
12	Blood (Superficial)	Leishman Donovan's bodies	4
	„ from spleen	„	1
	Smear preparations from spleen and liver (after death)	„	3
13	Blood	Filaria embryos	2
	Urine	„	3
14	„	Ova of Bilharzia	9
15	Exudation from tropical Phagedenic ulcers	Pathogenic bacillus	66
16	Smear preparations from spleen and lungs of rabbits	Rabbit's septicœmia	4
17	Smear preparations from spleen and lungs of fowls	Fowls' cholera	6
18	Water	Typhoid bacillus	4
19	Stools	Anchylostoma and other intestinal parasites	2
20	„	Amœba coli	4
	Pus from Liver abscess	„	3
21	Blood (bullock)	Anthrax bacillus	1
22	Preparation from spleen and liver of rats	Plague bacillus	5
23	Experimental inoculations on rabbits and guinea pigs	Tubercle and surra	11
24	Blood of Bovidœ	Surra Trypanos	14
		Total	453

B.—NON-BACTERIOLOGICAL.

1.—Microscopal examinations of sections of Patholgical tissues ...	... 5
2.—Enumeration of blood corpuscles, red ...	... 2
" " white ...	... 1
3.—Quantitative analyses of urine ...	...77
4.—Microscopical examination of urinary sediment ...	...50
5.—Radiographs ...	...15

F. A. ROUGET,
23rd. March 1905. M.B., C.M. Edin.

Medical Superintendent, Civil Hospital.

Lunatic Asylum.

Annual Report for 1904.

I have the honor to submit the following report on the health and sanitary condition of the Lunatic Asylum for 1904.

1. *General Statistics.*

The following table shows the number of inmates remaining in the Asylum on 1st. January 1904.

	Europeans.	Creoles.	Indians.	Chinese.	Total.
Males ...	4	100	129	7	240
Females ...	...	100	56	...	156
Total...	4	200	185	7	396*

* Exclusive of 3 patients escaped and still at large at that time.

2. Inmates in the Asylum on 31st. December 1904.

	Europeans.	Creoles.	Indians.	Chinese.	Total.
Males. ...	7	106*	138	7	258
Females ...	...	105	51	...	156
Total .	7	211	189	7	414

* including 1 patient under observation subsequently found to be sane.

3. The daily average during 1904 was as follows

Males ...	252.55
Females ...	154.56
Total ...	407.11

It shows an increase of 17.1 (or 14.73 m. & 2.37 f.) over the daily average of patients in 1903 and this is attributed to the relatively greater number of admissions, the smaller number of discharges and the lower death-rate.

4. The daily average of harmless imbeciles at the Barkly Asylum Lunatic Branch Wards was as follows :

Males	...	65
Females	...	29
Total	...	94

5. The following table shows the return of mental diseases, admissions and deaths in 1904 at the Lunatic Asylum :—

	Remaining at end of 1903.	Yearly total.		Total cases treated.	Remaining at end of 1904.
		Admissions.	Deaths.		
Idiocy ...	8	8	5	16	9
Mania ...	196	77	9	273	207
Melancholia ...	23	16	4	39	25
Dementia ...	122	13	5	135	121
Delusional insanity...	50	2	...	52	51
Total ...	399	116	23	515	413
Admitted on interim order, but found to be sane by Commissioners in Lunacy. ..	...	3	...	3	1*
	...	119	...	518	414

*Patient still in the Asylum on 31st December 1904.

6. The following were the admissions in 1904 :—

	Europeans.	Creoles.	Indians.	Chinese.	Total.
Males ...	3	32	42	7	84
Females ...	...	22	13	...	35
Total ...	3	54	55	7	119

91 (61 males and 30 females) were 1st admissions.
10 (8 males and 2 females) were 2nd admissions.
18 (15 males and 3 females) were readmissions from probation.

The admissions in 1904 were 12. (11 males and 1 female) more than in the previous year i.e. showed an increase of 11.2 o|o on those of 1903.

7. There were 79 Discharges in 1904 as compared with 81 in 1905 :—

	Europeans.	Creoles.	Indians.	Chinese.	Total.
Males ...	...	18	28	7	53
Females ...	...	13	13	...	26
Total ...	...	31	41	7	79

8. They may be classified as follows :

	Cured. Finally discharged.	Relieved. Discharged on probation to the care of relatives or friends.	Not improved. Transferred to the Barkly Asylum Lunatic branch wards	Total.
Males ...	3*	36	14	53
Females ...	3*	21	2	26
Total...	6	57	16	79

* including 1 male and 1 female found by the Commissioners to be sane at the time of their examination.

9· The number of insane persons in the Colony on 31st. December 1904 may be tabulated as follows :—

	At the Lunatic Asylum.	At the Barkly Asylum Lunatic Branch wards.	Out, on probation.	Total.
Males ...	257	72	39	368
Females ...	156	30	24	210
Total...	413	102	63	578

The estimated population on 31st. January 1904 as obtained from the Registrar General being 375,349 the proportion of total insane to population was 1.52 per 1,000 or 1 in 655.

The proportion in 1903 having been 1 in 704 there has therefore been a slight increase.

The percentage of recoveries (cured and relieved) to the admissions was 52.9 o[o as compared with 53.27 o[o in 1903 i.e. practically the same. 23 (17 male and 6 female) patients were finally discharged as cured, from the probationers as compared with 70 in 1903.

11. There were 23 deaths in 1904, as compared with 30 in 1903.

The death-rate to daily average was 5.66 o[o showing a reduction of 1.94 o[o over that of 1903.

12. The patients who died belonged to the following classes :

	Europeans.	Creoles.	Indians.	Chinese.	Total.
Males ...	...	9	5	...	14
Females ...	...	4	5	...	9
Total ...	...	13	10	...	23

13. Table showing the ages at which death occurred :—

Age.	Number of patients.
10—20	2
20—30	7
30—40	0
40—50	5
50—60	3
60—70	2
70—80	4
Total	23

14. Table showing the diseases from which these patients died :—

Influenza	2
Chronic dysentery	1
Malarial fever, quotidian	1
" , remittent	1
Tuberculosis	3
Debility	11
Secondary Carcinoma	1
General paralysis	1
Diarrhœa and senile decay	2
Total...	23

15. Five (4 male and 1 female) patients were reported by the Medical Superintendent to have died during the year, from the harmless imbeciles transferred to the Barkly Asylum Lunatic Branch Wards. 3 male patients were reported as having died among those discharged on probation.

II. *Prevalence of sickness in the different seasons of the year and general character of disease prevailing.*

16. The admissions into the two Infirmaries of the Lunatic Asylum amounted to 429 against 486 in 1903.

17. The daily average of sick as compared with that of the last 3 years was as follows :—

	1901	1902	1903	1904
Male Infirmary ...	15.92	13.29	13.82	10.81
Female Infirmary ...	19.32	14,75	8.99	14.76
Both Infirmaries ...	35.24	28.04	22.81	25.57

There has been a gradual reduction in the daily average of the male Infirmary but a sudden increase in the female one owing to the admission of several infirm patients suffering from chronic affections

18. Table showing the monthly admissions into the two Infirmaries, total stay and average stay per patient.

	Male Infirmary.	Female Infirmary.	Total.
January ...	15	14	29
February ..	24	21	45
March ...	13	17	30
April ...	24	13	37
May ...	15	23	38
June ...	15	10	25
July ...	26	11	37
August ...	28	7	35
September ...	29	10	39
October ...	18	11	29
November ...	30	19	37
December ...	19	19	38
Total ...	256	173	429
Total stay ...	3963	5404	9367
Average stay per patient.	15.4 days	30.2 days	21.8 days

19. Return of monthly admissions for intermittent fever, dysentery, diarrhœa, tuberculosis, lung affections and ulcers in both infirmaries :—

	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Total.
Intermittent Fever ...	6	23	14	13	12	6	7	6	4	2	8	5	106
Dysentery ...	...	...	..	...	...	...	1	1	...	1	2	2	7
Diarrhœa ...	7	3	...	1	1	1	2	4	5	3	9	8	44
Tuberculosis ...	...	...	...	...	...	1	1	1	.	...	...	...	3
Lung affections ...	1	2	2	6	8	7	6	1	4	7	5	2	51
Ulcers ...	3	2	...	1	...	...	...	...	...	..	...	...	6

20. From these tables it will appear that if we divide the year into quarters that the greatest number of admissions were in the last two quarters as shown in the following table :—

Admissions into Infirmaries in each quarter of 1904.

1st Quarter	104
2nd "	100
3rd "	111
4th "	114
Total	429

21. On the other hand if we divide the year into summer (November to April) and winter months (May to November) we find that there were 226 admissions in the former period as compared with 203 in the latter.

22. We find thus as usual the greatest number of admissions were for intermittent fever and that they occurred chiefly from February to May, after which they gradually fell till they reached a minimum in the months of September and October.

23. There was a reduction of 43 in the admissions for intermittent fever as compared with those of 1903—and a relatily smaller number of deaths, which is a favourable feature from a sanitary point of view.

24. The prevalent type of malarial fever was, as in 1903, the quotidian. There were 7 cases of tertian and 1 of remittent fever. The last named terminated fatally. The attacks of quotidian fever generally yielded to the administration of quinine, but some cases were tenacious and had to be treated with calomel and purgatives, intestinal disinfectants (e. g. Benzo Naphthol) stimulants and tonics, before they improved. One such case, of the quotidian type, died.

25. There were only 7 admissions for dysentery in 1904, showing a reduction of 6 on those of 1903. These cases occurred chiefly in the last six months of the year.

The type was generally mild, and yielded to the Ipecacuanha treatment, but one of them became chronic and the patient died from exhaustion.

26. Diarrhœa was much more prevalent in 1904 than in the previous year. As in the case of dysentery the greatest number (31) occurred during the last six months of the year.

27. 3 cases of tuberculosis were observed in 1904 i. e. exactly the same as in 1903. All 3 died.

Two of these cases are interesting as they commenced in the intestines and mesenteric glands and spread to the other organs in a secondary manner. They were attended with symptoms of debility and considerable emaciation and in one with chronic diarrhœa. Post mortem examinations showed miliary deposits in almost all the organs and tubercular ulcers of the intestines in the last named case. The mesenteric glands were chiefly affected and almost all contained cheesy deposits.

Lung affections were mostly prevalent during the colder months and were due chiefly to attacks of Influenza. There was a considerable increase of these cases in 1904 as compared with the previous year.

29. We had only 6 cases of phagedœnic ulcers of the lower extremities among the inmates of the Asylum although the disease was prevalent outside in an epidemic form. The patients having been seen early, their affections quickly yielded to rest and antiseptic applications. The cases occurred during the first four months of the year. This disease having been shown to be of contagious nature and caused by a special bacillus, it is probable that it was introduced into the Asylum by some of the servants who had contracted it outside.

III. *Meteorological conditions of the seasons and their probable effect with regard to sickness.*

30. The climate of Beau Bassin where the Lunatic Asylum is situated is very variable and liable to sudden changes of temperature, owing to the cessation or otherwise of the prevailing cool winds, i.e., the South East Trades, and their being replaced by warmer and less bracing ones from the North or North East, especially during the hot season. Under the circumstances it is to be expected, as it has been observed here, that these conditions will be favourable on the one hand to the development of malaria through the agency of anopheles mosquitoes. On the other hand when the Trade winds are prevalent in the cooler months, owing to the local conditions due to the direction of the Mount Ory spur at Moka to the windward, the wind is blown towards the Asylum with increased force. Under such conditions chills are more easily caught and Influenza and other lung affections are more prevalent in the winter months.

31. It is probable that the increased prevalence of diarrhœa and of dysentery in the last six months of 1904 may have been due to this cause.

32. Another factor which may have contributed to these complaints is the water supplied to the Institution from the Mare aux Vacoas. This water is obtained from the high lands from a region free from human contamination and is generally good in the rainy season, but in the dry season which corresponds precisely with the last 6 months of the year it is charged with vegetable matter undergoing decomposition and contains a great number of animalculæ of the class of Infusoria, and of algæ, which in spite of filtration at the water works, still remain in considerable quantity. The decaying vegetable matter as well as the algæ develop in the water certain gases, especially sulphuretted hydrogen, which are known to have irritating effects on the intestines.

34. The climatic conditions of the locality being very different from those of the Observatory at Pamplemousses it is very desirable that exact meteorological observations be made on the spot before definite conclusions can be arrived at in the matter.

IV. *Other observations concerning the Institution.*

35. Extensive sanitary works were commenced in 1904 for the extension of the underground drainage of the Institution with a view to collecting the refuse water of the bath rooms and washings from the latrines into covered tanks and the utilisation thereof for watering purposes.

36. These works which, when completed would have greatly contributed to the improvement of the sanitary conditions of the Institution were unfortunately interrupted at the end of the year and it is to be hoped that they will soon be completed.

37. It is desirable, as I stated in my last report, that the measures contemplated for the exclusion of mosquitoes from the wards and infirmaries, viz :—the protection of windows and other openings by wire netting, be carried out as soon as practicable. These measures which have been found so valuable in the reduction of malarial fever in other countries will no doubt prove equally effective here.

38. In conclusion I append notes of a case of carcinoma of the liver and other organs secondary to cancer of the breast which

is interesting from the fact that as the disease did not recur locally in the cicatrix and neighbouring glands after the operation and the patient died 4 months after from the effects of its generalisation, it is probable that such generalisation had already commenced when the operation was undertaken.

J. I. PADDLE,

9th. February, 1905.

Medical Superintendent,
Lunatic Asylum.

Appendix.

Case of extensive carcinoma of liver and other organs secondary to cancer of breast.

Chenguy Kani, an Indian woman aged 45 years, was admitted into the Lunatic Asylum on April 14th 1904 for mania, of a recurrent type, which had come on while in the Civil Hospital three days after the removal of the breast for cancer, the operation having taken place on the 11th of March. On admission into the Asylum she had a large granulating wound in the situation of the left breast. She was restless and unmanageable at first, but soon became quiet. On June 26th she suffered from a severe attack of Influenza from which she had partly recovered when she died on July 7th. For two or three days before her death, she had suffered from marked symptoms of dysphagia when lying down but which partly disappeared in the sitting position. An autopsy was performed on the 8th of same month and the following lesions observed :—

Body emaciated. Rigor mortis present ; conjunctivæ slightly yellowish ; well marked cicatrix on region of left breast except about centre where some granulation exists. No glands can be felt in left axilla. On opening abdomen liver found enlarged upwards to level of 4th rib and slightly downwards, and mottled with masses of secondary cancer. Some of these masses have a diameter of about 2 inches, a few measure 1 inch across and most of them are abont the size of a pea. They only slightly project above the surface of the liver, they are pinkish in appearance, mottled with small vessels and yellowish in the centre. Between these nodules the liver substance has a nutmeg colour. The liver was adherent in one point to the abdominal walls in the right flank and also to the anterior and superior wall of the stomach, Gall bladder half full of bile, the enlarged liver was found to compress the œsophagus slightly above the cardiac orifice by means of a cancerous mass extending slightly upwards in front of the œsophagus. The cancerous masses on section were found to extend throughout the liver in both lobes. Weight of liver 3 kilos 150 grams. Stomach almost empty contains some liquid consisting of mist. vini gallici. Œsophagus full of mist. vini gallici. Spleen had several small deposits of secondary cancer in its capsule. Kidneys pale, otherwise normal. Bladder empty. Uterus and ovaries normal. Intestines slightly congested, no enlarged glands in the mesentery. Heart flabby, slight greyish mark in pericardium at back of heart. Soft fibrinous clots in right ventricle. Black clots in left. Valves normal.

Left lung adherent to left side by a small cancerous nodule. Several of these found scattered in left pleura, both on the surface of the lung and of the diaphragm, a few are found in the costal pleura in the spaces between the 4th & 5th, 5th & 6th, 6th & 7th ribs. These begin about the level of the cicatrix of the amputated breast and extend in a scattered manner as far back as the spinal column. One of the small masses was adherent to a similar one on the visceral pleura. No secondary cancerous deposits in the interior of the lung, which was œdematous and congested. Right lung adherent to walls and diaphragm by old pleuritic adhesions, a few slight secondary cancerous deposits also seen on its visceral pleura here and there. Lung congested and œdematous. Meninges somewhat adherent to skull cap in centre. Slight serous effusion in arachnoid spaces, Pia Mater congested, no other marked abnormal state of brain observed.

J. I. PADDLE,

9th. February, 1905.

Medical Superintendent,
Lunatic Asylum.

Annual Report

On the work performed by Government Analyst in 1904.

I have the honor to report as follows on the work performed by me in 1904 in the Laboratory under my charge.

57 investigations were undertaken at the request of the Judicial Department, involving the separate examination or analysis of 242 articles or pieces of conviction, while 42 investigations or reports, having reference to 70 different articles, were required by the Medical and Health Department, H. M. Customs and the Municipality.

The total number of articles examined or reported upon thus amounted to 312 and showed an increase of 59 on work done in 1903.

As shown by the following table the total work of the Laboratory has progressively increased during the last three years, chiefly on account of the analyses of the Judicial Department.

Table showing number of articles examined or reported upon :

1902-1904.

	For the Judicial Department.	For the Medical and Health and other Departments.	
	Number of articles.	Number of articles.	Total.
1902 ...	151	76	227
1903 ...	156	97	253
1904 ...	242	70	312

There has apparently been a reduction in the analyses performed for the Medical and Health and other Departments and Municipality in 1904, but this is due partly to the fact that only one sample of milk was received from the last named corporation as compared with 26 in 1903, and also to the material impossibility, in presence of the almost continuous flow of pressing work from the Judicial Department, of coping successfully with the exacting and long analyses, such as those of water, wine, butter, lard and other alimentary substances, which were required by the Medical and Health Department and in consequence, as happened in 1903, a certain number of these analyses have had to stand over for want of sufficient time to properly attend to them.

This state of things is no doubt to be regretted, as these analyses are of importance from a sanitary point of view and in the interest of the public; but as I have already reported they require special apparatus, much time and extra care and attention for their performance, I submit that, pending the erection of a Government Analytical Laboratory, which is contemplated, it is absolutely necessary that, in the mean time, the small and incomplete one under my charge be placed on a proper footing and provided with all the appliances required for the purpose, and that I be given some assistance for their more expeditious performance.

I have already submitted a list of the instruments more urgently needed and as it has been approved and sent for, I trust that it will be possible, when they arrive, to go through more work than hitherto.

Analyses performed for the Judicial Department.

The 57 medico-legal investigations above referred to were transmitted from the following District Courts in the following order of frequency :—

	Number of Investigations.	Number of Articles examined.
Plaines Wilhems ...	13	42
Flacq ...	9	34
Savanne ...	8	22
Grand Port ...	7	43
Moka ...	6	42
Port Louis ...	6	36
Rivière du Rempart..	4	9
Black River ...	2	11
Pamplemousses ...	1	2
Oil Islands (Agaléga)	1	1
Total ...	57	242

They were required in connection with the following cases :—

	Number of Cases.	Number of Articles examined.
Murder	10	64
Attempt at murder	5	13
Murder and rape	1	5
Involontary homicide	1	2
Wounds and blows causing death...	1	5
Larceny with violence ...	1	1
Infanticide	2	5
Rape or attempt at rape ...	17	91
Sodomy	4	19
Poisoing or alleged poisoning ...	14	34
Alleged attempt to deceive ...	1	3
Total	57	242

Most of the alleged cases of poisoning were investigations required at the request of the Government Medical Officers who, in suspicious cases of short illness or of sudden death, had not found sufficient pathological evidence to account for the same and had concluded to the possibility of poisoning. Only some cadaveric ptomaines were found in the majority of these cases.

In 4 cases submitted for analysis the following substances were respectively found, viz : zinc, washing soda, lime and areca nut powder, and common salt (in excess).

The only one worth mentioning is that attributed to zinc.

A gentleman and some of the members of his family, after partaking of a dish prepared from frozen beef, were seized with symptoms of gastric irritation, while his children who had eaten of the same meat at an early dinner had not been affected. Some of the cooked beef sent for analysis showed marked presence of zinc. It probably existed therein as chloride, but this could not be certified with certainty as the meat also contained some added chloride of sodium. The cook was suspected and subsequently arrested, but the case could not be proved against him.

The greatest number of pieces of conviction examined were in cases of murder and rape.

In the 17 cases of the last named, blood was found in 9 and spermatozoa in 4.

Well marked blood stains were found in most of the pieces of conviction sent up in cases of murder. In one case, as many as 24 articles had to be individually examined.

To show the value of these examinations to the prosecution for the purpose of corroborating the evidence of the witnesses the three following typical cases may be mentioned :

(1) An Indian woman while asleep in her bed was awakened in the early morning by feeling some one pulling at her necklace of sovereigns. She immediately put up her hand and was wounded by a knife. She cried out and her mother who was in the next room succeeded in stuggling with a man in the dark as he passed her door.

The victim bravely went to her mother's assistance and held the thief by the legs with her wounded hand. He however managed to escape. A neighbour was suspected and the Police found in his room a pair of trousers recently stained with blood on the lower part of the legs. As he could not satisfactorily explain the same, he was arrested and the examination of the stains having shown that they were due to the blood of a mammal he was convicted.

(2) In a case of infanticide some stained clothes and a few drops of milk taken from the breast of a single woman originally suspected of this crime were submitted for analysis. The stains showed the well marked appearances of a lochial discharge and the milk contained colostrum masses, granular matter and epithelial cells as seen therein soon after birth.

(3) In a case of attempt at rape alleged by a woman to have taken place in a small pumpkin field, her statement was corroborated by the marked presence of green stains, which were shown to be due to chlorophyl, on the back of her dress and on both knees of the accused.

An interesting case was prosecuted at the request of the Customs Department. A trader having imported a certain quantity of tissue paper bound up in books labelled " Copies de lettres " it was urged that he had tried to deceive the Customs Authorities, as his real object in importing the same was to sell it as cigarette paper on which an extra duty was charged. Some packets of paper already cut up for use as cigarette paper were purchased by the Police in the vicinity of his shop and they were shown on analysis to be identical in composition and quality with those of the newly imported books. The paper was however very inferior for smoking purposes and could not be compared with that generally imported as such into the Colony.

The case was tried, but lost before the District Court.

Analyses for the Medical and Health and other Departments.

The 42 analyses or reports already referred to were distributed as follows :—

	Number of analyses.	Number of samples.
Sanitary Department, Port Louis	15	38
Additional Assistant Sanitary Warden, Curepipe	6	8
Do. „ „ Pls. Wilhems.	3	3
Barkly Asylum and Lunatic Asylum	15	18
H. M. Customs	2	2
Municipality	1	1
	42	70

The articles analysed or reported upon were as follows :

	Samples.
Milk	21
Water	9
Lard, ghee, pickles, biscuits, preserved fruits, preserved mushrooms	9
Examination of slides for plague, tubercle bacilli pneumococci, &c.	13
Urine, quantitative examination of sugar, &c. ...	6
Verification of lactometers	2
„ „ thermometers	2
Examination of articles stained by bichloride of mercury after disinfection	2
Reports on honey and gasoline apparatus... ...	2
Medicine and drugs	4
	70

Only one sample of milk, as already stated, was received from the Municipality. This apparent falling off points in my opinion to a more satisfactory state of things and is due no doubt to the fact that there has been a greater tendency on the part of the Indian sellers of Port Louis to sell milk of better quality and to the deterrent effects on the delinquents of the severe fines inflicted on them the year before, and to their having preferred, in presence of the prospect of having to pay for the cost of the analysis in the bargain, to plead guilty whenever taken in contravention.

Judging however from the quality of the milk supplied to the Lunatic Asylum and the absence of complaints from other Government Institutions, I believe that the contractors and milk sellers, as a whole, have understood that it was in their interest to supply the public with milk of better quality than they had done before.

The samples of milk analysed were reported as follows :

9 watered 10—20 %.
5 skimmed.
1 stale.
The rest not adulterated.

As stated in my last report I have not for some time met with a sample of milk sweetened with cane sugar after adulteration with water.

This practice seems to have become extinct among the milk sellers.

Two of the cases of skimmed milk were prosecuted, but fell through owing to the Magistrate having given the sellers the benefit of the doubt in presence of the evidence that underfed or sick cows might produce milk poor in butter.

As I have pointed out it is very important in the interest of sick persons and especially of infants who require a certain proportion of fat for their proper nourishment that milk of fair quality be sold by milk sellers. Under the circumstances it is highly desirable that the recommendations I made in my last report be carried out, and that the Sanitary Regulations be amended so that no one should be allowed to offer for sale milk containing less than 2.5 o/o of fat or less than 8.5 o[o of non-fatty solids. The last figure is the standard adopted in England by the Society of Public Analysts and by the Board of Agriculture, as the lowest limit for genuine milk, and which I have found to hold good for the milk of cows in this Colony. I have adopted, however, the lower figure of 2.5 o[o as the limit for fat, owing to the poor breed of many of the cows of the Indians.

In the mean time it is advisable that sanitary and municipal Inspectors be instructed, whenever they take samples of milk for analysis, to try and secure another sample from the milk seller's cow, when he possesses one, as the latter will serve as a better standard for the comparison of the milk he is selling. This sample will of course have to be taken by the Inspector himself from the whole milk drawn in his presence at the usual time the cow is milked.

The examination of the milk from the seller's cow will have further the advantage of showing whether the animal is in good condition, and should marked disease be indicated, a veterinary surgeon might be sent to report on the necessity or otherwise of destroying it.

9 samples of alimentary substances were analysed or examined, consisting of lard, ghee, pickles, biscuits, preserved fruit and mushrooms.

The lard was found to have been adulterated with 20 o/o of beef stearin and about 20-25 o[o of cotton seed oil.

The analyses of lard, butter and fatty substances are generally some of the most troublesome to deal with from an analytical point of view. The various " constants " of the substance (specific gravity, melting point, volatile acids, saponification and Iodine numbers, &c) have to be carefully examined, and it often happens that adulterants having high and low constants have been so cleverly introduced by the manufacturers of the adulterated article that the results point to a substance which might possibly be genuine. This was found to have been the case with most of the constants in the sample of lard examined. It was, however, possible by the excellent Becchi-Milliau reaction to show the marked presence of cotton seed oil therein, and by that of Belfield to estimate the proportion of beef stearin present in the sample.

A very useful instrument for such analyses is a refractometer, which unfortunately the Laboratory does not possess. I have included one in the list of the instruments sent for and it is hoped that it will render great service in future cases.

The other articles were found in a marked state of deterioration and condemned as unfit for human food.

Certain articles (a blanket and table napkins) were examined for the effects of bichloride of mercury disinfection thereon. They were found to bear greyish or brownish stains, which had been noticed after they had been washed with soap and water and subsequently ironed.

These stains were caused by the reaction of the alkali of the soap on the mercury and its precipitation as oxide in the tissues and its subsequent reduction to the metallic state on the application of the hot iron. It was possible that this state of things would cause a loss of elasticity in the fibres and lead to their becoming more brittle and liable to give way at the stained places on subsequent washings.

It was recommended that before using the soap such articles should have been repeatedly rinsed out in running water in order to completely remove all traces of the sublimate.

A certain quantity of honey having been imported by a passenger coming from an infected port, some difficulty arose as to how it could be dealt with, seeing that it was not a prohibited article nor one liable to disinfection. It was however feared that it could under certain circumstances possibly be as dangerous as dates in transmitting contagious diseases.

The matter was referred to me for report and I stated that as only the pathogenic organisms, the introduction of which could in such a case be apprehended, were those of cholera and plague, it was unlikely that the honey could convey their germs as it has an acid reaction, whereas these germs require an alkaline medium for their development. The presence of traces of formic acid generally found in fresh honey would further interfere with their growth owing to its marked antiseptic and antifermentative properties.

In the event however of the honey coming from a decidedly contaminated locality there would be no harm, if it were not quite pure or fresh, in having it diluted with water and boiled down to 32°. Beaumé, measured while hot. This would not only destroy all possible organisms it may contain, but at the same time preserve it from further deterioration.

I was also asked to report on the possible dangers from a gasoline apparatus which it was proposed to set up in a Government Institution. I called attention to the fact that however useful such an apparatus might be, in presence of the opinion expressed by Wurtz in his Dictionary of Chemistry certain important precautions to guard against explosion or fire were necessary, and that it would be unadvisable to have it set up too close to a main building.

I shall finally refer to three analyses of drugs and medicines which are of some interest.

(1) An Indian trader had imported some dark greenish masses which he had declared to consist of a drug on which he wanted only to pay an *ad valorem* duty. It was referred to me for analysis and I was able to report that it consisted of masses of the oleo resin, or the active principle of Cannabis Indica matted together with hairs from the plants, some gum and other impurities. It was, in fact, the substance commonly called *churrus* or the oleo resin roughly extracted from the leaves and flowering tops of the Cannabis Indica plant by rubbing them between the hands.

The special duty imposed on gunjah was accordingly charged and I understand that the trader agreed to pay the same.

(2) A sample of "Vin de Quinquina au Malaga" was received from the Customs Department for the purpose of ascertaining whether it had been prepared in accordance with the formula of the Codex.

It was found to contain a wine agreeing in every respect with that of Malaga, but the determination of the proportion of cinchona used in the proportion of the wine was not easy to ascertain.

The Codex not stating with precision which special variety of grey cinchona bark had to be used in its preparation and the proportion of alkaloids found in those which might be employed being more or less variable, there were no exact data to go upon. The alkaloids of the bark being further the only element on which an analysis could have been founded with some precision there was a further difficulty in the fact that the wine did not take up the whole of this constituent from the bark during its preparation.

A quantitative analysis of the sample showed that it contained a proportion of total alkaloids per litre consisting chiefly of cinchonidine and of a small quantity of quinine, which, allowing for the fact that only about 2/3 of the alkaloids would be taken up by the wine, might render it consistent with its having been prepared, in the quantities defined by the Codex, from the variety of Cinchona Huanico Peruviana.

(3) Lastly a sample of a mixture was sent up for analysis which presented unusual difficulties. On quantitative analysis it was found to contain copaiba, sandalwood oil and turpentine, mixed up with syrup, some gum and a vegetable infusion containing tannin ; but the question was whether it had been well prepared by the chemist and whether the first three constituents did not exist therein in excess of their normal doses.

Owing to the small quantity received it was not possible after extraction of these oils from the mixture to separate them properly by fractional distillation and to state in what relative proportion they existed therein.

A process was accordingly devised, based on their specific gravities and the new method adopted by Messrs. Sanglé-Ferrière and Cuniasse for the analysis of absinthes, viz : the relative absorption of Iodine by each constituent, which was found to solve the difficulty.

As this method may be of use to others in similar cases, I trust a short account of the same may be of some interest.

15 c. c. of the mixture, corresponding to a table spoonful, as marked on the bottle for one dose, was extracted with petroleum ether and the latter evaporated off in a current of dry air under a bell jar. The total amount of oils was found to weigh .600 gramme and on a careful measurement thereof with an accurate narrow pipette, to have a volume of .62 c.c. at 27 ° c.

10 drops of sandalwood oil, copaiba and turpentine were placed in three tared glass stoppered phials and found at the same temperature to weigh respectively .369, .378 and .263 gramme and their specific gravities taken at the same time to be as follows :— .969, .988 and .871.

25 cc. of alcohol (96 %) were added to the contents of each phial and a definite amount of Hubl's solution of Iodine and mercuric chloride in alcohol introduced and left in contact for 24 hours. A blank experiment was made at the same time.

The .369 gramme of sandalwood oil was found to have absorbed as much Iodine as would have been decolorised by 23.5 cc of $\frac{N}{10}$ sodium hyposulphite. 1 gramme of the oil would therefore in the same time have absorbed the amount of Iodine decolorised by $\frac{235}{.369} = 63.6$ cc. of $\frac{N}{10}$ sodium hyposulphite.

Similarly the co-efficient of absorption for 1 gram of copaiba was found to be 77.2 cc. and for turpentine 165 cc.

Lastly the .600 gram of the mixture of the oils obtained from the evaporation of the petroleum ether was found to absorb Iodine corresponding to 44.7 cc. of $\frac{N}{10}$ sodium hyposulphite.

The problem was then solved as follows : —

Let x= weight in gram of sandalwood oil in the .600 gram
„ y= „ „ „ copaiba „ „
„ z= „ „ „ turpentine „ „

and we have the three following simultaneous equations :—

(1) $x + y + z = .600$ grammes.
(2) $63.6\,x + 77.2\,y + 165\,z = 44.7$,
(3) $\frac{x}{.969} + \frac{y}{.988} + \frac{z}{.871} = .62$ cc.

By the solution of these equations I found that
x = .371 gram or 10 drops nearly of sandalwood oil.
y = .189 „ or 5 „ of capaiba
z = .040 „ or 1 to 2 „ of turpentine.

The mixture was accordingly shown to have been well prepared and to have contained the above-mentioned oils in ordinary doses.

In conclusion I trust that these examples of the work performed in the Government Analyst's Laboratory in 1904 will suffice to show its importance to the Judicial, the Medical and Health and other Government Departments, and justify the request I have made that it should be more completely fitted up and that I should have some assistance in order to render it still more efficient in future.

J. I. PADDLE,

29th March, 1905.

Government Analyst.